

COMPUTERWORLD

Lotus moves to bolster suites

By William Brandel

With its desktop application business flagging in the face of fierce competition in the suite market, Lotus Development Corp. this week will launch a campaign pushing team computing.

Some observers are calling it a last-gasp attempt by Lotus to reverse its market share slide (see chart below).

The company is marketing team computing as a way for workgroups to speed up projects. Instead of users passing along a file in a classic workflow fashion, they would work interactively off the same file placed on a file server.

Team computing will be positioned as an adjunct to the Cambridge, Mass., developer's communications products, such as CC:Mail and Notes. The technology will be layered into new versions of Microsoft Corp. Windows 95 and OS/2 applications as well as Lotus' next generation of 16-bit Win-

Lotus, page 16

Bitter suites for Lotus

Vendor/Product	1993	1994
Microsoft's Office	78.1%	79.7%
Lotus' SmartSuite	18.8%	15.6%
WordPerfect/Borland suites	3.1%	4.7%
Total suite shipments	3.2M	7.5M

Source: International Data Corp., Framingham, Mass.

IS revamp on track

By Julia King

Having rounded the halfway point on a massive, enterprisewide information technology overhaul, Burlington Northern, Inc. has begun deploying systems that give the entire railroad — and some of its largest customers — real-time

access to critical shipping and scheduling data.

Late last month, the \$5 billion company also threw the switch on a state-of-the-art network operations center in Fort Worth, Texas, where it is consolidating virtually all of its logistics operations and business processes.

Driving both initiatives is a need to significantly bolster customer service and get maximum productivity from the railroad's 25,000 miles of track, 65,000 freight cars and 2,500 locomotives.

"When we were delivering coal and grain, it didn't matter if we showed up on a Tuesday or a

IS revamp, page 15



Newspaper

MCI 'mobilizes' sales

By Michael Fitzgerald

MCI Communications Corp. this month will kick off the largest sales force automation project ever. The potentially \$60 million investment in mobile client/server technology is designed to transform the \$15 billion telecommunications giant into an information provider.

Successfully executing the 5,000-unit Field Automation Project is so crucial to MCI that "I don't see how I'm going to be able to be effective without this two years from now," said Rick Ellenberger, the project's champion and senior vice president of worldwide sales for MCI's core



MCI's Rick Ellenberger not only championed the sales automation project, he was also one of its first users

Business Markets unit in Atlanta.

MCI is so eager that the speed of its deployment schedule borders on hyperactive. After launching a pilot in February, MCI this month will put 1,700 notebooks into the field. It expects to finish the roll-out by mid-June.

This aggressive schedule is in place even though MCI is using IBM PC Co. ThinkPad 755CD notebooks, which have been in short supply since their introduction last October. An IBM spokesman said the company was surprised by initial demand for the \$7,000-plus model, a premium platform that was expected to

MCI, page 127

Hitachi lifts big iron bar

By Craig Stedman

A new king of the dinosaurs is about to stomp into the data center swamp. And it is likely to be quite a while before another mainframe beast emerges that can match its processing brawn.

Following a path its rivals declined to tread, Hitachi Ltd. plans

today to introduce a promised series of water-cooled mainframes based on a 124 MIPS processor.

The Skyline systems, expected to cost from \$3 million to \$20 million, deliver twice the uniprocessor throughput of current System/390 machines from Hitachi and rivals IBM and Amdahl Corp.

IBM and Amdahl supplier Fujit-

su Ltd. both opted against developing another generation of water-cooled systems as mainframe demand shifts toward lower-cost, air-cooled machines with CMOS microprocessors. That makes Hitachi's Skyline series the only high-end game in town, and users and analysts said there is still plenty of need for such a hunk of big iron.

"It's a little early to call the big mainframe dead," said Bill Neuser, manager of capacity planning and support at Great Western Bank in Northridge, Calif. "The need for a follow-on [water-cooled system] is there, and it's not going to go away until the CMOS processors get faster."

Great Western's batch jobs have to run on a single processor, and with IBM's initial CMOS-based devices only rated at 13 MIPS, adopting that technology "would require us to go backward" on

Hitachi, page 16

Client/server politics: Blame enough for all

By Rosemary Cafasso and Julia King

Information systems managers know that installing a client/server financial system is no cakewalk. But many do not expect to end up dancing through a political minefield, either.

These days, turf battles between IS and user factions are growing ever more intense, owing to higher user involvement in client/server projects. Also at issue are sneak attacks from vendors, which bypass IS and go directly to users to win allegiance to their products, users and analysts said.

Then when projects flounder and products do not work right, the finger-pointing begins.



DAVID MARSHALL

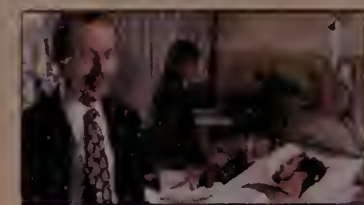
"I can't think of a single example when it didn't happen," said John Parkinson, a consultant and national director for technology at Ernst & Young in Dallas, referring to the political skirmishes that break out on client/server projects.

One catalyst for such problems is the sheer number of unanswered questions engendered by client/server projects, Parkinson added. Those questions include "who

User politics, page 127

A MEDICAL MOON SHOT?

For years, Dr. Brent James at Intermountain Health Care has used computerized patient records to improve care and cut costs. So why are these mission-critical systems more dream than reality at most hospitals?

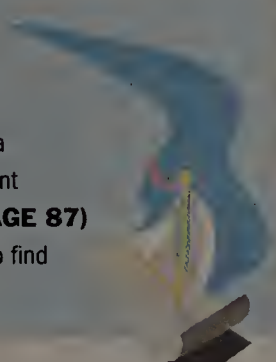


Management, page 78

**WHO DO THE FORTUNE 500
CALL ON WHEN MOVING
TO THE PENTIUMTM PROCESSOR STANDARD?**

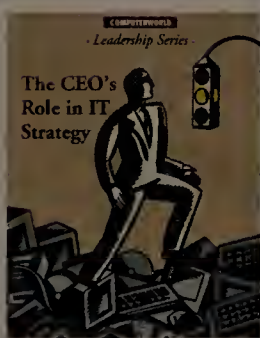
Going with the flow

Managing paper and electronic materials that include graphics, text and images is a daunting task. Even more difficult is weeding through the product claims of document management vendors. Check out **DOCUMENT MANAGEMENT** in **GUIDE (PAGE 87)** and **DESKTOP IMAGING PRODUCTS** in **MARKETPLACE (PAGE 117)** to find out the key functions and applications of these technologies.



COMING NEXT WEEK

ATTENTION CEOs: In the rush to embrace client/server, some conversion projects fail. Part of the reason is a meddlesome CEO. In next week's Leadership Series, Bill Carico discusses the role senior nontechnical management should play in corporate IT decision-making.



■ Users hope **Apple's** latest reorganization will lead to greater product availability, lower prices and a stronger commitment to business solutions. **NEWS, page 2**

■ Third-quarter deliveries of **RISC-based IBM AS/400s** may involve only low-end models, with high-end systems pushed back to late in the year. **NEWS, page 4**

■ Applications vendor **SAP AG** can't dodge criticisms that its technology is less than top notch. **NEWS, page 6**

■ **SAS Institute** plans to extend data access and analysis tools. **NEWS, page 10**

■ Users say **Novell** has smoothed the migration path with **NetWare 4.1**. **NEWS, page 12**

■ **Digital** plans a product splash for this week, with the high-end **TurboLaser** server as the headliner. **NEWS, page 14**

■ **Unisys** readies its line of scalable parallel processing systems, which were developed in conjunction with **Intel**. **NEWS, page 24**

■ Slow sales of **Sybase's** core database have caused the vendor to miss quarterly financial estimates. **COMPUTER INDUSTRY, page 32**

■ **Paul Gillin** says IS professionals can make a difference by supporting **OURS**, a volunteer

How do you measure up?

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group that serves as the voice of the user. **EDITORIAL, page 36**

■ **James Martin** says information technology professionals must obtain a knowledge of diverse technologies. **VIEWPOINT, page 37**

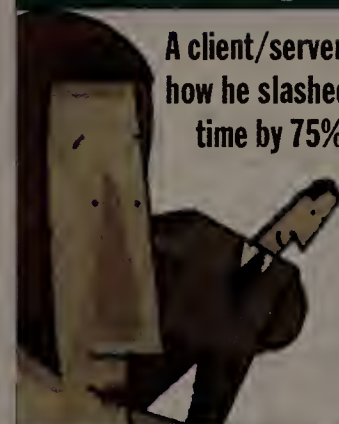


■ A **Computerworld** test drive shows that the **Power Macintosh 6100** DOS-compatible machine is a technical marvel that's reasonably priced—but it's not for every user. **DESKTOP COMPUTING, page 39**

■ Users are solving their own systems management woes by stitching together different vendors' wares. **WORKGROUP COMPUTING, page 51**

■ At **Networld/Interop '95**, a bevy of vendors unveiled plans to embed network management features into their devices so users can keep up with growing networks. **ENTERPRISE NETWORKING, page 59**

Being there



A client/server developer reveals how he slashed user data entry time by 75% and saved himself months of fixes by observing users in action.

SEE IN DEPTH,
PAGE 99

■ **Digital's** software strategy remains a mystery. **LARGE SYSTEMS, page 67**

■ Big players jump into the market to help IS fix the year 2000 date problem. **APPLICATION DEVELOPMENT, page 73**

■ The National Marrow Donor Program's **STAR** system is the perfect matchmaker. **MANAGEMENT, page 82**

■ Stuck in a rut? IS managers reveal how to help staffs break the routine. **CAREERS, page 104**

■ Stop thinking about the Internet as an alien force, **Charles Babcock** says. **NEWS, page 128**

Calendar..... Page 84
Company Index Page 124
Editorial/Letters to the editor Page 36
March 31 Stock Ticker Page 125
How to contact Computerworld Page 128

Executive Briefing

Strategic moves could make a difference at two major IS sites. Telecommunications giant **MCI** will ring in a new self later this month when it unveils what may be the largest sales force automation project to date. And **Burlington Northern** is rolling out systems designed to boost customer service and internal productivity by giving its staff and some of its largest customers real-time access to critical shipping and scheduling data. The railroad also threw the switch on a state-of-the-art network operations center in Texas. *Cover 1*

You'd better be a good politician if you want to succeed in client/server. Many IS managers are finding themselves caught up in turf battles between IS and user factions because of the high user involvement in client/server projects. When projects flounder and products don't work right, the finger-pointing and cover-ups begin. *Cover 1*

Organizational issues may limit the use of object-oriented technology. While object technology can help corporate IS gain control of applications development and produce systems that fit business needs, corporate IS managers last week said cultural obstacles often prevent objects from fulfilling their potential. That's because satisfying immediate business unit needs comes at the expense of building an enterprisewide object infrastructure. *Page 20*

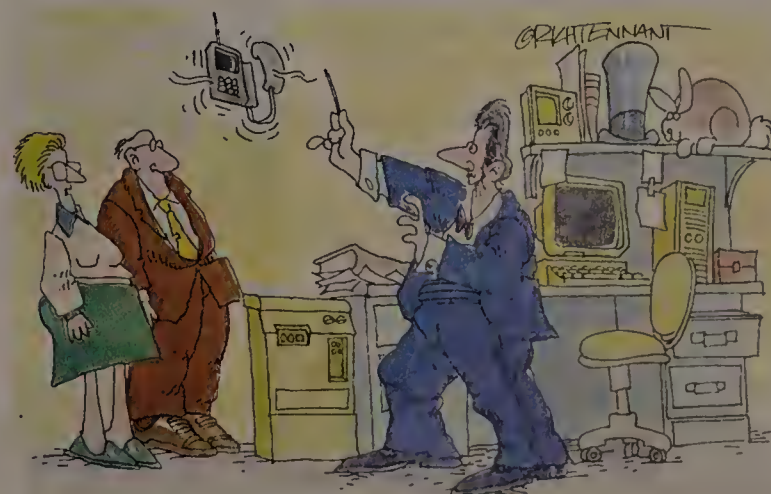
Inadequate software, impatient physicians and inconsistent medical terminology are some of the roadblocks the health care industry faces in creating computerized patient record systems. *Page 78*

Mitsubishi International, a New York-based trading company, is overhauling its network architecture to better meet the demands of its partners and customers. *Page 59*

The Pentagon's research arm leverages defense research and development dollars to provide benefits for the world of commercial computing. *Page 63*

IBM's Louis Gerstner tries to send out a clear message through his senior executives: **OS/2** is a strategic product. *Page 32*

The 5th Wave by Rich Tennant



His name is D'Marco D'Magician. He's helping us tap into some unregulated wavelengths for our cellular PDAs."



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Users hope revamp wakes up Apple

By Lisa Picarille

■ **Users are crossing their fingers that last week's management shake-up at Apple Computer, Inc. will jar the company into a more responsive mind-set.**

The Cupertino, Calif., desktop supplier announced it would reorganize the company by function rather than along lines of business. The strategy, which will be implemented during the next several months, replaces the hardware and software divisions with four new groups: engineering, manufacturing and distribution, sales and customer support, and marketing and customer solutions.

Apple also ousted Ian Diery, executive vice president of PC hardware, and shuffled around a few other executives (see story at right).

Industry watchers said the restructuring under scores Chief Executive Officer Michael Spindler's growing concerns about Apple's inability to cut prices, deliver new products and license the Mac OS to key vendors.

"Focusing on these four sections seems to make sense, but only time will tell," said David Wu, an analyst at S. G. Warburg & Co. in New York. The reorganization spreads responsibility for forecasting to numerous individuals rather than having it tied to one person.

Users, however, were less concerned with Apple's organizational chart and more interested in the availability of products. Apple has a long history of not being able to accurately predict demand for its products.

One Macintosh manager at a large West Coast bank said, "I don't care who

sits in the chair as long I get my boxes."

"If they are making moves that would lead to more available products, then that would be positive," said Brian Comnes, manager of the information center at DHL Worldwide Express in Redwood City, Calif. "Deliverability has been very hit-and-miss."

Specifically, Comnes said he is under pressure from DHL users to purchase a number of Apple 5100 systems. But dealers have told him that none will be available for months.

Several complaints

Others have similar gripes. Apple deliveries have "been a significant problem for the last year and a half. More of a problem than ever before," said Bill Monteith, executive director of Mac IS, a Mason, Ohio-based industry association.

Eventually, the boxes users receive will be tailored for their specific market segments. Analysts applauded this tack, but some users worried that Apple's new focus might indicate a lessening commitment to providing enterprise business products.

"Spindler eliminated the enterprise group [two years ago], and now Apple doesn't have the same focus on large businesses," Monteith said. "We can only hope the reorganization will improve the dialogue between Apple and large business users."

At least one large Apple customer is not sure Apple can compete at the enterprise level.

"The Mac is a great desktop machine, but not a server," said Jeff Van Skyhawk, manager of corporate information technology planning at Bose Corp., an elec-

tronics manufacturer in Framingham, Mass.

Bose has more than 2,000 Macintoshes and is moving to a more open systems strategy. "There they are out of their class. They should stick to being the best user-friendly machine out there," Van Skyhawk said.

Big business will not spend more money on Macintoshes until there are more Macintosh clones, thus boosting the number of machines available, or until Apple can guarantee delivery of ma-

chines, according to Mike Bailey, a systems integrator at Lockheed Martin's Missile and Space Co. in Sunnyvale, Calif.

"Apple has to get in the game with more [clone makers]. They will never be a strong player in the corporate market if they can't supply all the computers needed. Corporate users will not stand for that kind of delay," Bailey said.

Ⓕ **Macintosh clones** are coming and one gets a thumbs-up. See page 39.

Executive shuffle to correct problems

Apple's recent restructuring is really the second phase of a re-engineering effort that first kicked off

during a cataclysmic June 1993. That was when John Sculley was ousted as CEO, and the company changed to a divisional structure and posted its biggest loss ever—\$188.3 million.

The most recent re-vamp was designed to expand Apple's presence across the board, according to an Apple release.

First, Apple must rectify several problems.

Sources close to the company claim that chronic delays in delivering products and signing up clone makers may be remedied now that Ian Diery,

Apple's former executive vice president of PC hardware, has resigned.

Three Apple insiders blame Diery for Apple's recent misforecasting problems. Sources close to Apple also said Diery was a staunch opponent to Apple's licensing of its proprietary operating system.

Conversely, Dan Eilers, president and CEO of Claris Corp., Apple's software subsidiary, is a longtime supporter of licensing the Mac OS. He was tapped last week to

run Apple's solutions and marketing division as well as EWorld, Apple's on-line service.

—Lisa Picarille



Apple's Dan Eilers will run the solutions and marketing division

Build-to-order approach eases product backlogs

By Jaikumar Vijayan

In a fundamental shift away from traditional manufacturing processes, top-tier PC vendors have begun to implement build-to-order manufacturing. The goal is to provide users with more customizable, lower-cost desktop systems while addressing chronic supply problems on the vendor side.

Driven by recurring demand forecasting nightmares and faced with an increasingly commoditized, rapidly changing marketplace, major desktop vendors IBM PC Co., Hewlett-Packard Co., Compaq Computer Corp. and others have decided to build final products only after firm orders are placed.

That strategy is already paying off. For instance, finished goods and parts inventory at the PC Co. — which has been plagued with inventory management problems — has dropped by more than 65% in the past several months, said Joseph Formichelli, IBM's vice president of manufacturing.

HP, meanwhile, is already seeing cost reductions. The manufacturing flexibility offered by the build-to-order process and the cost savings associated with it have "allowed us to offer lower prices than either Compaq or

IBM at acceptable return on investments," said Boris Elisman, HP's manager of desktop PCs.

Another plus, according to Bill Helming, a director at Pittiglio Rabin Todd & McGrath, a consultancy in Weston, Mass., is that manufacturers are now better able to deliver many different configurations while maintaining a tight lid on manufacturing costs and inventory. For the moment, most manufacturers are building to channel orders for specific vendor models, but the flexibility afforded by building to order will allow more customization down the line.

Developments among the key PC suppliers to abandon the common method of building to demand include the following:

- IBM is about to complete a worldwide changeover to this strategy, under which a full 95% of its desktop products will be built against actual orders, Formichelli said.

- HP has enacted what it calls a "postpone manufacturing" process, under which 50% of its PC products are assembled after a customer has ordered. By the summer, all of HP's PC products will be built this way.

- Desktop market leader Compaq is well into moving its manufacturing away from a build-to-plan model and to-



IBM's Joseph Formichelli says a new manufacturing plan has cut inventory

ward a process similar to HP's, although it did not give details.

The move to build-to-order strategies is also being tied to broad shifts in development, forecasting, procurement and manufacturing processes, according to Brij Kathuria, Compaq's director of corporate operations quality.

For example, a number of development changes are making it easier to build to order. By reducing the number of overall parts in their products, standardizing common parts across systems and forging closer links with key suppliers, vendors have managed to reduce the costs of materials and assembly, Helming said. These changes also make inventory and procurement management functions easier to handle, he said.

Instead of manufacturing and then stocking finished goods, these vendors have begun to stock up on items such as standardized system chassis, mechanical components, motherboards, hard disks, floppy drives and memory.

More direct links with distribution channels also give vendors more accurate sales data on which to base their parts-replenishment forecasts, Helming said.

One outcome of such re-engineering is that top-tier vendors in 1994 delivered products on the requested

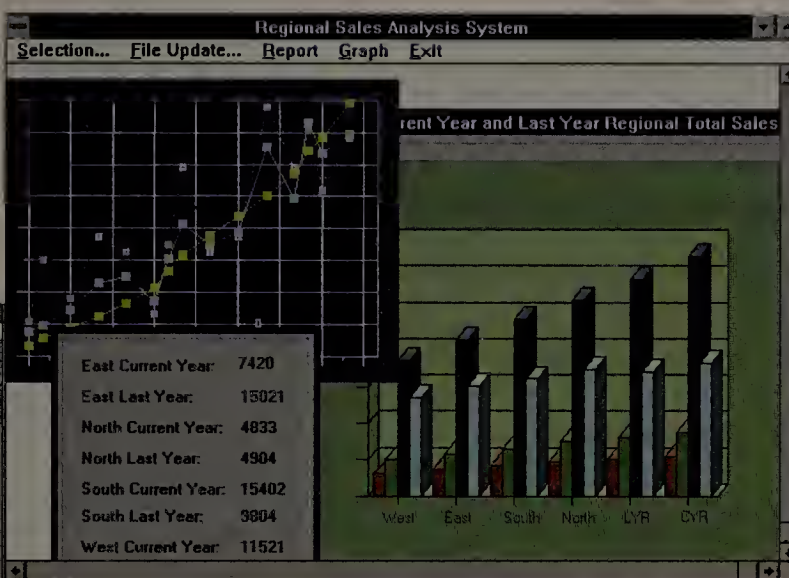
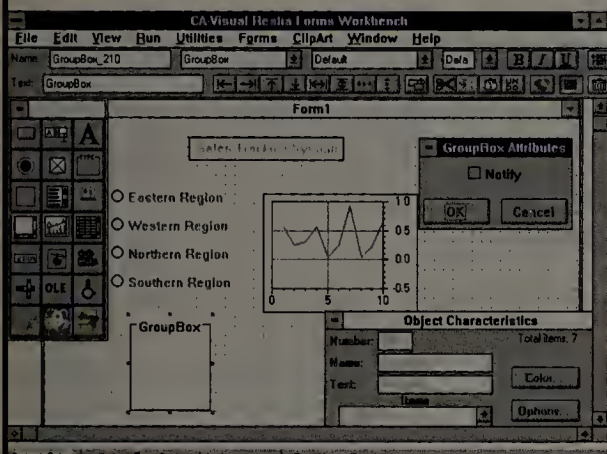
Ⓕ **Maintenance management software** may be up and coming. See page 68.



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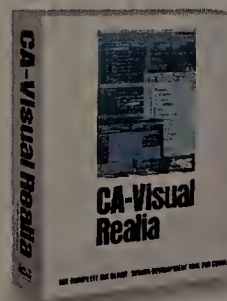
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SATAN unleashed on 'net

Software 'exorcism' advised by security experts, not users

By Gary H. Anthes

SATAN, the long-awaited network "attack scanner," was posted to more than two dozen public Internet sites last week, prompting cries of alarm from some computer security experts and vendors selling products to defend against it.

However, the Security Analysis Tool for Auditing Networks (SATAN) failed to ignite mass hysteria in the user community, where a number of shops welcomed it as a valuable addition to their security toolboxes.

SATAN is a software package intended to probe networks of Unix computers to search for security flaws. It consists of HyperText Markup Language (HTML) documents, C code and Perl scripts that generate HTML code. Its use requires an HTML viewer such as Mosaic.

Try it, you'll like it

Intended for legitimate diagnostic work, SATAN is likely to be used by criminal hackers as well.

"SATAN is a good thing, and it's free," said Albert R. Belisle, a security professional at a large financial institution. "There is no excuse for not using SATAN."

Belisle said system administrators who fail to try SATAN on their Unix networks are like those who fail to get inoculations in the face of a flu epidemic.

However, others warned against indiscriminate use of SATAN. "Products such as SATAN can be

damaging in networked environments if installed and used by non-security experts," said an advisory issued by Axent Technologies in Rockville, Md., a developer of computer security software.

Doug Johnson, a senior scientist at a Boston-area high-tech firm, tried SATAN on his LAN, a network with 20 Unix workstations con-

down to is should we make it easy for people to do bad things?" he asked.

There are some real concerns, however.

"SATAN is guaranteed to have a large impact on the security of the Internet," said an advisory issued last week by the U.S. Department of Energy's Computer Incident Advisory Capability (CIAC). "SATAN is being promoted as a security tool for system administrators, not an attack tool for crackers. Unfortunately, it can be utilized in either manner. The safety of any particular system is dependent on who utilizes SATAN first."

"By configuring a system correctly, installing all the latest patches and monitor-

ing system usage, most of SATAN's techniques can be countered, or at a minimum detected," the CIAC said. "Unfortunately, complete protection from SATAN is difficult. [Some] of the vulnerabilities it looks for do not yet have satisfactory solutions."

SATAN can be run at three levels, each more aggressive than the last. "The fourth level, breaking into systems, has not been implemented," said SATAN co-author Wietse Venema, a computer security researcher in the Netherlands.

Some hellacious locations to check on SATAN

SATAN CAN BE FOUND AT:
ftp.win.tue.nl as /pub/security/satan-1.0.tar.Z

SATAN DOCUMENTATION IS AVAILABLE FROM:
ftp://ftp.win.tue.nl/pub/security/satan_doc.tar.Z

FOR ADDITIONAL INFORMATION ABOUT SATAN, SEND MAIL TO:
majordomo@wzv.win.tue.nl

PUT THE FOLLOWING TEXT IN THE BODY OF A MESSAGE TO ASK FOR SPECIFIC INFORMATION:
get satan mirror-sites
get satan description
get satan admin-guide-to-cracking.101

nected directly to the Internet with no firewall. It did not find any significant security holes, but the scanner did give him an added measure of comfort, he said.

"There is nothing in SATAN that was not available to people before," Johnson said. "The difference is that SATAN is really nicely crafted."

Peter Tippet, president of the National Computer Security Association in Carlisle, Pa., acknowledged the usefulness of SATAN, but said it should have had controlled distribution. "What it boils

AS/400 RISC rebirth to start at low end

By Craig Stedman

IBM's AS/400 midrange line is still due for a rebirth as a RISC platform in the third quarter, but the family will likely be a bit smaller than expected.

IBM now plans to ship only low-end versions of the promised PowerPC-based systems at that time, according to industry sources.

The low-end systems are expected to be limited to a single processor, the sources said. Larger systems and multiprocessors are now targeted for initial shipments by year's end, although those machines may not be available in volume until early 1996, they added.

Analysts said the PowerPC-based machines are intended to erase the AS/400's Oldsmobile image and put it on a more equal horsepower level with Unix hardware.

Glenn Van Benschoten, director of systems product management at IBM's AS/400 Division in Rochester, Minn., said last week that while it plans to "roll out a full line of RISC machines this year," that does not necessarily mean "full unconstrained volume" on all models during 1995.

Marc Cohn, senior vice president of information systems at Enterprise Rent A Car Co. in St. Louis, said he would be "a little bit discouraged" if he cannot get the high-end RISC models until next year, especially because the machines were originally expected to ship this quarter.

Enterprise, which runs its business on 18 high-end AS/400s, could make it through the first quarter of 1996 by upgrading its current systems, Cohn said. But the company had hoped to start shifting to the PowerPC-based hardware in the next few months to avoid any possibility of hitting the wall, he said.

"I really expected to have a good half-year cushion, and now it looks like I might not have any," Cohn said.

A high-end delay could also give the AS/400 Division revenue headaches this year, said Myron Kerstedder, an analyst at Gartner Group, Inc. in Stamford, Conn. "Those are the machines where the dollars are, and people might wait until next year instead of buying the current hardware," he said.

The PowerPC-based machines are intended to erase the AS/400's Oldsmobile image, analysts said.

Government agency opens up security program

By Gary H. Anthes

WASHINGTON

After operating for 30 years behind closed doors, the General Services Administration's (GSA) computer security unit came out into the sunshine last week.

Thomas R. Burke, who last week became head of the GSA's Office of Information Security, said the office is expanding beyond its traditional roots in the classified world and into civilian agencies and the private sector.

A top priority will be to help develop a security and privacy framework for the Clinton administration's National Information Infrastructure (NII), he said.

The NII is a concept for the next-generation Internet, a broadband, multimedia network linking businesses, schools, libraries and homes.

"We are trying to be more involved in the community as a whole, dealing with

industry and being open and candid with people about what we are doing and how," said Burke, who is acting deputy commissioner. He said the GSA has begun talks with vendors such as Electron-

but the [Clinton] administration said to have a more open dialogue," said Joe M. Thompson, commissioner of the GSA's Information Technology Service.

Out of line?

Some users were wary of an expanded government role in security. "They may develop grandiose solutions that, even though technically feasible, are not economically implementable," said Albert R. Belisle, a security expert at a large financial institution. He called on the GSA to avoid working "in a vacuum."

Burke said the security office will develop comprehensive training courses in information security for government managers, end users and contractors. One objective will be to help the parties

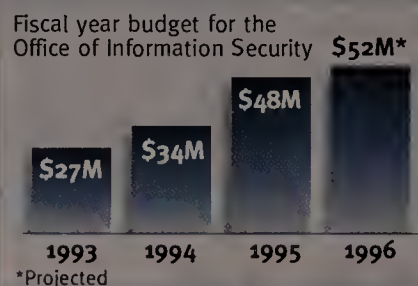
develop a common understanding of security needs, he said. Courses will begin next year. Burke said the GSA will also help establish one or more "controlling authorities" for issuing and managing data encryption keys for NII users.

"We want everyone to agree that those controlling authorities are the ones we are going to put our trust in," Burke said.

F. Lynn McNulty, associate director of computer security at the National Institute of Standards and Technology, said there is an unmet need for operational services such as cryptographic key management. "The GSA's problem is going to be how [to] get the start-up money to really make it happen in an era of tighter budgets."

Many of the GSA's services will be provided on a cost-reimbursable basis to other government agencies, the GSA said.

The GSA will now apply some of its healthy resources to security concerns in the commercial sector



Source: General Services Administration, Washington

ic Data Systems Corp., GTE Corp., AT&T Corp. and Motorola, Inc. about possible partnerships to bring security to the NII.

"We don't normally talk about security,

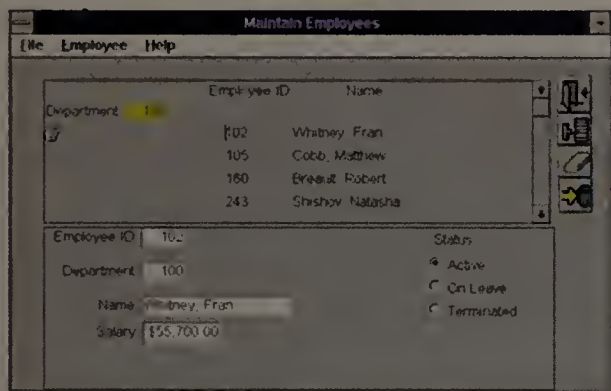


GSA's Thomas Burke:
"We are trying to be more involved with private businesses"

DEVELOPER PRODUCTIVITY COMPARISON

Sybase

PowerBuilder 4.0



52 lines of code

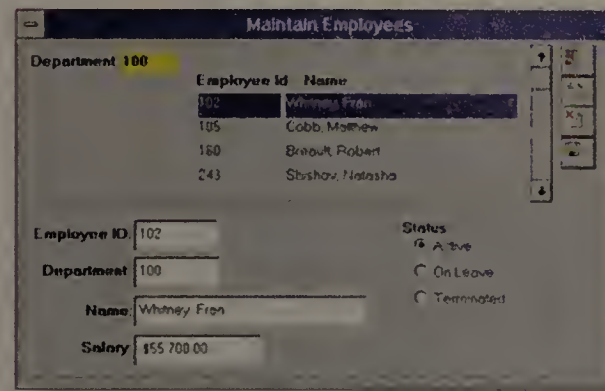
```

dw_detail.SetTransObject ( sqlca )
MasterWindow.Open
ELSE
COM Application.Open
IF dw_detail.SetTransObject ( sqlca )
COM SQLCA.DBMS=ProfileString("PB.INI","Data
Mess dw_detail.SetTransObject ( sqlca )
base","DBMS"," ")
ELSE END IF
SQLCA.DbParm=ProfileString("PB.INI","Da
ROL MasterWindow.Open
Mess ed open(w_employees)
END long en Application.Close
Menu long ro DISCONNECT using SQLCA;
w_employees rownu IF SQLCA.SQLCODE <> 0 THEN
Menu empnu ROLLBACK using SQLCA;
w_employees IF dw_detail.SetTransObject ( sqlca )
Menu COM RTEXT)
PrintS ELSE END IF
Menu ROL MasterWindow.Open
Close Messa CONNECT using SQLCA;
Menu detail") IF SQLCA.SQLCODE <> 0 THEN
w_employees END IF
Messa MessageBox("Connect
Menu Master Error",SQLCA.SQLERRTEXT)
w_employees close(p HALT
) Master END IF
Menu dw_detail dw_master.settransobject ( sqlca )
Show dw_detail dw_detail.settransobject ( sqlca )
dw_detail IF dw_master.Retrieve() = -1 THEN
Master ROLLBACK using SQLCA;
MessageBox("Retrieve","Retrieve Failed")
    
```

** Taken directly from "PowerBuilder Getting Started"
© 1991-1994 By Powersoft Corporation.

Oracle

Developer/2000



4 lines of code

```

exit_form;
create_record;
delete_record;
commit_form;
    
```

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ORACLE

SAP's technology stirs controversy once again

By Rosemary Cafasso

■ A pair of reports taking shots at SAP AG's R/3 software surfaced last week, renewing speculation about whether the client/server applications suite is outdated and overly difficult to use.

The latest reports include a research bulletin from Plant Wide Research Group, a small consultancy in Billerica, Mass., that warned clients to think twice before selecting R/3. The research group claims the software is too mainframe-oriented and far more difficult to implement than many users first imagined.

In addition, a critical article recently appeared in the German business magazine *Wirtschaftswoche*. It claimed that some R/3 users in Europe were having performance problems and referred to those users as "lemmings to the slaughter." In one example, the article claimed that a German bakery company was unable to process orders on R/3 for three days, although the user denied that claim in a subsequent letter to SAP.

A SAP spokeswoman last week said these reports were aimed at SAP because it is the market leader. Further, she said, the *Wirtschaftswoche* piece had several inaccuracies.

Some users and analysts said that while they do not believe R/3 users are headed for disaster, they do believe there

is an element of truth to the cautionary reports.

Specifically, users said R/3 does have a more centralized, mainframe approach, which can prevent users from easily distributing the application modules to multiple platforms. R/3 runs on a variety of Unix platforms as well as Microsoft Corp.'s Windows NT. A version for IBM's MVS mainframe operating system is also on tap, although no delivery date has been announced.

Users also confirmed that because of the sheer volume of R/3 functions and modules, the package can be difficult to implement [CW, March 27].

More difficult

Plant Wide Research said it conducted independent research—though among only a limited number of its clients—that indicated that the R/3 implementations could get more complex and difficult than they are today. The consultancy said the bulk of R/3 users are just moving beyond initial implementations and will run into difficulties as they install more modules.

"The more you implement, the more of a resource requirement it demands," said Bill McSpadden, president of Plant Wide Research. "People are just now beginning to run into this."

SAP has been fighting rumors and crit-

icisms about R/3 for more than a year. Last spring, SAP insisted that rival Oracle Corp. was behind a widely circulated memo from a source who called himself "Deep Throat" and criticized the R/3 technology. Oracle denied any connection with the memo, however.

Then last August, Gartner Group, Inc. in Stamford, Conn., warned its clients to use caution in selecting R/3 because SAP had sold so many licenses that there was a shortage of consultants on the market. SAP continues to acknowledge this problem as it builds its consultant base.

SAP has built an R/3 customer base of more than 2,000—more than twice as many users as some competitors, such as Dun & Bradstreet Software, have—in the two years it has been shipping the client/server software. Many users have said that the items some observers cite as weak points to R/3—most notably its huge number of different functions—are key reasons they selected the software in the first place.

But some users have rejected the software for those same reasons.

For example, the Laminar Systems division of Allied Signal Corp. in LaCrosse, Wis., picked client/server software from Baan Co. over both SAP and Oracle last year. Kenn Senn, manager of process re-

engineering, said there were several reasons SAP did not make the cut, including a lack of application functionality that the company required and the expected implementation time.

"It was going to be a more extended [installation] than Baan, and that was very important to us," Senn said. "We are under pressure to get things done."

Concerns vs. commitment

Some customers have raised concerns about some R/3 features, yet they remain committed to the software. Connie DeLetis, vice president of information systems at National Semiconductor Corp. in Santa Clara, Calif., said the characterization of R/3 as warmed-over mainframe technology is essentially true.

"They really did take it from a host mentality," DeLetis said.

That would be a big problem if not for SAP's promise to deliver its Application Link Enabling technology this year, he said. This middleware technology, scheduled to ship with Version 3 of R/3, will allow users to link different R/3 modules.

Some analysts suggested that the recent R/3 reports amount to little more than sour grapes. "People are taking shots at the front-runner," said Ed Black, an analyst at Aberdeen Group in Boston. "While there isn't conclusive evidence of widespread successes, neither are there many horror stories."



IBM muscles into tape drive competition with Magstar

By Craig Stedman

Mainframe users said high-capacity tape drives and cartridges being introduced by IBM this week may finally make the computer giant a worthy rival to tape market leader Storage Technology Corp.

But it will be more than a year before most commercial shops can put the IBM products to much use.

The Magstar devices can store 10G bytes of uncompressed data—a twelvefold capacity increase over existing 3480/3490 tape technology. Magstar also transfers data three times faster than the older tape technology, and it costs about 45% more than a 3490E on a per-drive basis, IBM said.

However, IBM confirmed earlier reports that a key feature enabling numerous small data sets to be stored on the Magstar cartridges will not be ready until mid-1996 [CW, Feb. 6]. Without that, most users will not be able to take full advantage of the 10G-byte capacity.

Stacking it up

Bell Sygma, Inc., the information systems and outsourcing unit of Bell Canada, Inc. in Toronto, will likely consider IBM again when Magstar supports the so-called volume stacking feature, said Mike Maggs, vice president of technology at Bell Sygma. But until then, "it doesn't sound that wonderful," he said.

The importance of volume stacking was underscored by an IBM survey of 63 mainframe shops, which showed

they were using less than 25% of the 800M-byte capacity on a majority of their 3480/3490 cartridges, said Dan Sheehy, tape storage marketing manager at IBM. That is because of the difficulty of storing multiple data sets on a cartridge without automatic stacking tools.

Magstar's capacity, cost and throughput all sound impressive (see chart below), said Stan Corker, an analyst at International Data Corp. in Framingham, Mass. "But having a 10G-byte drive is worthless unless you can improve the efficiency of putting data on the cartridges," he said.

Even when volume stacking is available, users will not be able to remove cartridges with multiple data sets

Market share

StorageTek dominates the mainframe-class tape drive market. It had a 58.2% share last year, compared with 24% for IBM, according to International Data Corp.

from a tape library without losing the mapping that keeps track of the files, IBM acknowledged. It would not say when tape removal would be supported.

Al Alioto, director of resource management at Kaiser Permanente Health Plan, Inc.'s Northern California data center in Walnut Creek, Calif., said Magstar could "really make it compelling for us to look at IBM again." Like Bell Sygma, Kaiser currently uses StorageTek libraries and tape drives.

Another option

With volume stacking and Magstar's capacity, IBM's low-end 3494 library could become a viable alternative to StorageTek's products, Alioto said. "It's a problem having all these small data sets on different tapes," he added. Kaiser does manual stacking now, "but that takes a lot of overhead" in system resources.

Volume stacking was supposed to be included in the initial MVS version of Magstar, which is due out in the second half of this year. But IBM redesigned the stacking technology after potential buyers complained about the company's plan to require them to use the latest release of Data Facility Storage Management Subsystem software, Sheehy said. Magstar will now emulate a 3490E drive for stacking, allowing earlier storage management software to be used, he added.

The new drive, which was code-named NTP for New Technology Prototype, will ship in late July in a Unix/SCSI version. The MVS/Escon device will follow later in 1995 for use in IBM's low-end 3494 library, which will be able to support a mix of Magstar and 3480/3490 drives.

Ticker tape parade

IBM's Magstar tape drive will compete with Storage Technology's TimberLine 9490 and RedWood SD-3 devices

FEATURES	IBM MAGSTAR	STORAGETEK TIMBERLINE	STORAGETEK REDWOOD
Uncompressed capacity	10G bytes	800M bytes	50G bytes
Transfer rate	9M byte/sec.	6M byte/sec.	11.25M byte/sec.
Recording method	128-track longitudinal	36-track longitudinal	Helical scan
Availability	Second half 1995	Shipping now	Limited shipments
List price with Escon controller	\$60,225*	\$55,465	\$162,000

*Per-drive price, based on two-drive configuration

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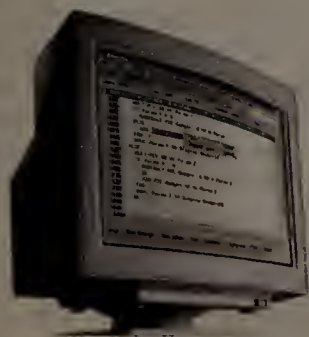
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Long-distance market poised to open up

Ameritech ready to enter arena; competition likely to lower prices

By Ellis Booker

With a nod from the U.S. Department of Justice last week, Chicago-based Ameritech Corp. edged closer to becoming the first of the postdivestiture Baby Bells to enter the \$68 billion long-distance market.

After years of often rancorous debate, the telecommunications industry finally seems poised for a new era: Open competition in the long-distance market as well as the local exchange. For end users, this watershed event likely means better prices, technological innovation and, for a time, confusion.

Telecommunications managers in Chicago greeted the news with optimism about attractive prices. However, they fretted somewhat over how the new environment would make their buying decisions much more complex — an increasingly common complaint among telecommunications and network managers.

"In the past, the only serious players [for long distance] were one of four carriers and that was complex enough," said Roger Stehman, telecommunications manager at Regency Systems Solutions in Oakbrook Terrace, Ill., a subsidiary of Hyatt Corp. that provides information systems and telecommunications services to Hyatt Hotels Corp. and other hotel chains. In a year or two, Stehman continued, "we may have 10 or 12 viable competitors to choose from."

"It's going to be a massive amount of people to pick from," agreed Denise O'Neil, telecommunications manager at Wm. Wrigley Jr. Co. in Chicago.

Both O'Neil and Stehman anticipate Ameritech and

other Bell companies will offer desirable rates in order to attract long-distance customers.

Tom L. Nolle, president of CIMI Corp., a telecommunications consultancy in Voorhees, N.J., has conducted business surveys that indicate users will switch between compatible carrier services only if the price differential is at least 5% or 6%. "And since the interexchange carriers can be expected to retaliate against discounts offered by the [local exchange carriers], prices could drop up to 12%," he said. Nolle said he expects the competitive environment to stabilize at about a 9% lower price for calls affected by the new competition.

Competition benefits users

Stehman noted that the presence of alternative access carriers in the local loop that provide access to long-distance carriers already has proved beneficial, pushing down the prices charged by both Ameritech and long-distance carriers for comparable access services. The net benefit, Stehman said, has been reductions in the range of 10% to 20%.

According to Robert Rosenberg, president of Insight Research Corp. in Livingston, N.J., a plus for buyers in a fully competitive setting will be the arrival of one-stop shopping — once customers settle on a supplier. The "killer app," he said, will be carriers that can supply local and long-distance service as well as voice and data equipment.

However, Stehman said it was still an open question as to whether it will be cheaper to buy products from individual producers or go with a bundled offering from one entity. Hyatt has two years left on its bulk long-distance contract with AT&T for voice and data services. That three-year contract is in excess of \$10 million.

Like the other six former regional Bell operating companies, Ameritech has long coveted entry into the lucrative long-distance arena from which it was barred following the breakup of the Bell System in 1984. In late 1993, Ameritech formally requested permission for trial long-distance service in exchange for opening its local network to competitors. In its original filing with the Justice Department, Ameritech had asked for an Illinois-wide test.

Legal lowdown

Last week, a Justice Department recommendation to support a much more limited plan was delivered to U.S. District Court Judge Harold Green, the overseer of the 1984 Consent Decree that broke up AT&T. The current plan calls for allowing Ameritech to resell long distance in Chicago and Grand Rapids, Mich., after local loop competition is established. Green has yet to rule on the Justice Department filing.

Meanwhile, a rewrite of the federal communications law that would both open local markets and permit the Baby Bells to enter the long-distance arena appeared to have been stalled last week in the Senate. Congressional proponents were still optimistic, however, and said the legislation would be addressed again in May. Some legislators said they believed they even have the votes to sustain a presidential veto.

But Nolle said he would prefer open market tests, such as Ameritech's, to run their course before federal legislation opens up the industry nationwide.

"I'd like to see the Feds lay off on their proposals before we see what the affect of the Ameritech plan is going to be," he said.

Separately last week, Pacific Telesis proposed to freeze its basic services prices for three years as part of a larger plan to open its local network to competition by 1997.

Observers expect Ameritech and other Bell companies will offer desirable rates in order to attract long-distance customers.



News Shorts

Oracle says buying Lotus would be 'interesting'

Oracle Corp. Chief Executive Officer Larry Ellison recently told *Computerworld Hong Kong* that the prospect of his company's acquiring Lotus Development Corp. "is a very interesting scenario" that could help bring Oracle's much-delayed groupware plans to fruition. Yet Ellison denied he is involved in talks to buy or merge with Lotus. He also acknowledged that Apple Computer, Inc. CEO Michael Spindler "gets a little bit sensitive about" Ellison's repeated allusions in the press that he could run Apple better than Spindler does. Meanwhile, Oracle plans to ship Oracle7 Release 7.2, a version of the database with improved replication features, by month's end.

Dataquest creates stir

A Dataquest, Inc. report created quite a ruckus last week. Among other outcomes, the unpublished document predicts that IBM will kill OS/2 when the operating system fails to gain market share after Microsoft Corp.'s Windows 95 debuts. Piqued IBM officials denied they would abandon the system and pointed to increased expenditures on advertising for OS/2 as a demonstration of their resolve. The also noted a recently mandated campaign to enlist developer support (see story, page 32).

Amdahl makes trade

After not selling any of the systems despite nearly a year of marketing,

Amdahl Corp. has dropped plans to use NCube's massively parallel processors in a database server. Sunnyvale, Calif.-based Amdahl confirmed it is switching to Cray Research, Inc.'s SPARC-based CS6400 high-end symmetrical multiprocessor (SMP). Amdahl's mainframe users are expected to like the SMP box more.

Informix changes tool pricing

Informix Software, Inc. announced it revised prices on its New Era development tool kit last week in an effort to

quell user anger over expensive run-time fees. Basically, Informix has broken apart the various pieces of New Era so users can buy them separately. Run-time licenses now cost \$150 per user, rather than \$500.

CSX promotes IS executive

CSX Technology, Inc. in Jacksonville, Fla., has promoted John F. Andrews from vice president of applications systems to president of the company. At CSX, which provides systems and software support to CSX Transportation, Andrews will oversee information technology services at the firm's railroad operations and at two sister companies.

Platinum buys developer

Continuing a buying spree, Platinum Technology, Inc. in Oakbrook Terrace, Ill., agreed to purchase Answer Systems, Inc., a developer of help desk software in San Jose, Calif. The deal is a stock swap valued at \$38 million. Platinum Technology has primarily been a mainframe database tools vendor, but it is now putting together a framework for managing enterprise systems across networks of MVS and Unix systems.

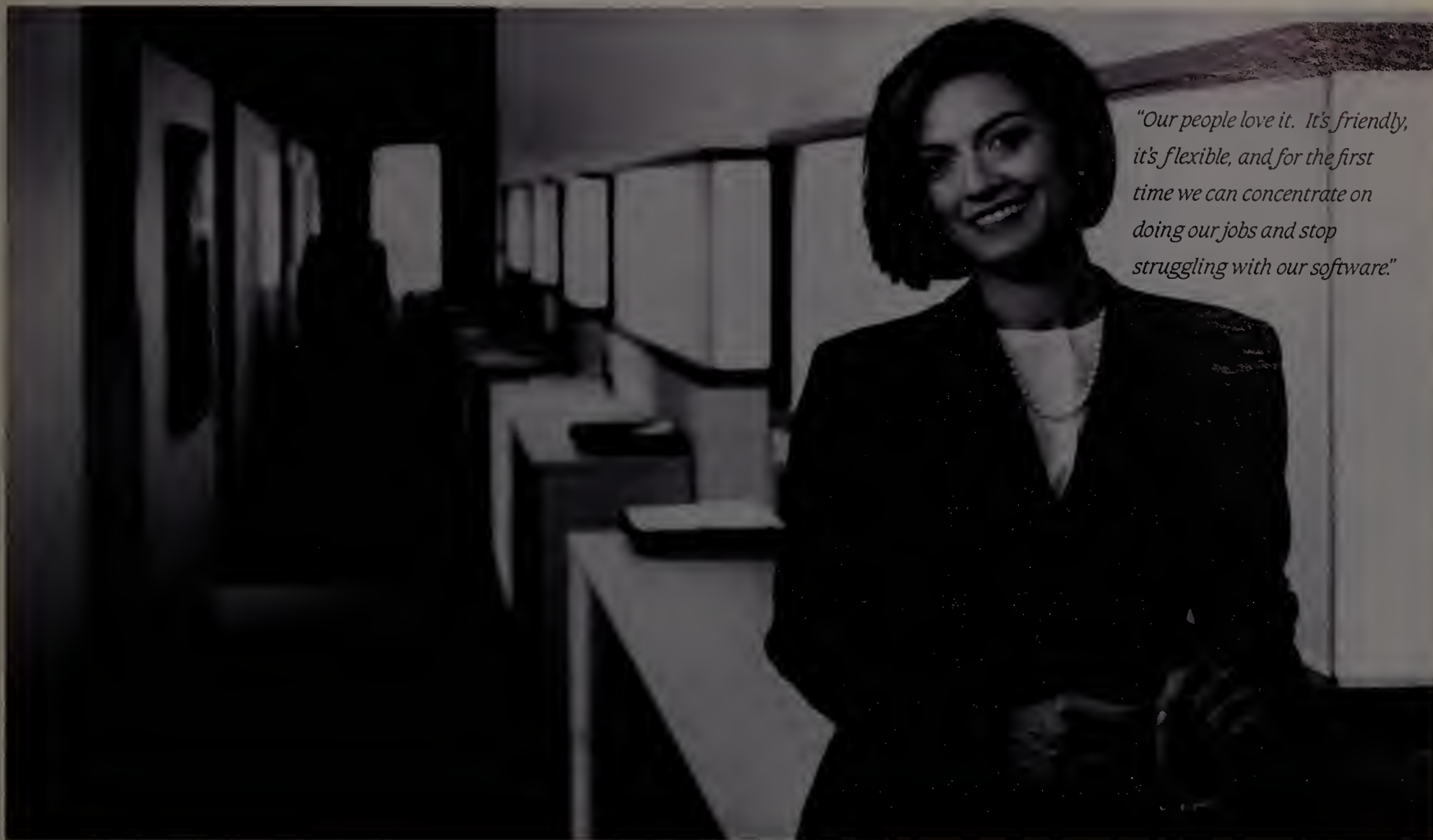
Hermes support group forms

Software distributor Software Spectrum in Garland, Texas, last week announced the formation of the Software Spectrum Systems Management Server Alliance, a group that aims to help its members reduce the monetary and time investments required to plan, implement and support Microsoft's Systems Management Server (SMS), also known as Hermes. Alliance members will receive scripts, asset identification tables and other development items not included with SMS.

SHORT TAKES Sybase, Inc. in Emeryville, Calif., last week announced several marketing programs aimed at health care, oil and gas and other vertical industries... EMC Corp. in Hopkinton, Mass., plans next week to formally introduce its promised RAID-S mainframe disk array. The array will support multiple RAID levels, data formats and disk drive sizes in a single box [CW, Jan. 30]... Next Computer, Inc. began shipping upgrades to several development tools last week, including a speedier version of a key object relational data mapping product. The Redwood City, Calif., vendor also bought the rights to the Objective C programming language for an undisclosed sum from Stepstone Corp.



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SAS users call for better tools, more visibility

By Rosemary Cafasso
ORLANDO, FLA.

The SAS Institute, Inc. last week responded to user demands for better tools to manage data by outlining plans to ship data warehouse management products and new data analysis applications by

next year. In addition, the company confirmed it would begin shipping the SAS System, its core data storage and analysis product, for the Macintosh.

Macintosh support will benefit users such as the University of Georgia, a long-time SAS user. The school has nearly 200 Macintosh users who have had to shift to

terminal emulation mode and access a host-based SAS System to get at SAS data. The Macintosh support will give them native access to SAS, said Greg Nelson, manager of host systems and statistical software support.

While many users at the annual SAS User Group International Conference

here applauded these efforts, some also said they wished the company would pump up its competitive position.

Some users said that at their companies, SAS is still considered an out-of-date mainframe supplier. As a result, they must push the harder-to-convince users and management to bring in additional SAS software, such as its warehousing and application development products.

"They aren't well known, and that's my stumbling block," said Diane Brown, director of clinical systems at Athena of North America, Inc., an insurance company in Indianapolis that is currently working on a warehousing project with SAS software.

SAS is somewhat of an odd duck in the

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SAS installed base

Environment	Number of sites
PC	14,400
Mainframe	6,600
Unix servers	4,500
Minicomputer	2,800

industry. It got its start in 1976 as a mainframe statistical software provider, but today it has a massive customer base — about 29,000 customer sites and 3 million users — as well as a few dozen data storage, analysis and access products.

The statistical software piece of its business now accounts for only 17% of total revenue, which was close to \$500 million last year. The bulk of revenue came from warehousing software, tools for data access and analysis, applications and application development.

"The mainframe cloud around it is very, very heavy," said Dan Bruns, a systems programmer at the Tennessee Valley Authority in Chattanooga, Tenn. "They aren't geared for marketing. What saves them is it is an incredibly stable product."

SAS "can live off [its customer base] pretty well," said Clare Gillan, an analyst at International Data Corp. in Framingham, Mass. "They grow it at about 10% a year, and the rest of the [revenue] growth comes from existing customers."

Users and analysts said this latest round of SAS product plans primarily addresses the needs of current users.

The warehousing management tools, which will include such items as a scheduler for data extractions, are intended to automate the more mundane warehousing jobs.

Tony Fisher, a SAS group manager, said the company will begin rolling out these tools next year as part of an overall warehouse framework.

The new applications will include financial and human resources data management programs, which will also debut in 1996, according to Wink Swain, general manager of new market development at SAS.



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NetWare 4.1 gets high marks

Migration proves a pleasant surprise

By Laura DiDio

■ Large corporate Novell, Inc. shops say they have found the upgrade path to NetWare 4.1 smooth going and fraught with none of the perils that beset them in previous migrations to NetWare 4.0 and 4.01.

The migration to 4.1 "is going well. Certainly it's a big improvement over the users who attempted to upgrade to NetWare 4.0," affirmed Jamie Lewis, president of the Burton Group, a Salt Lake City consultancy.

Despite positive early reports, large organizations with 1,000-plus users are proceeding with caution. That is, they are upgrading one or two departmental LANs at a time rather than risking a large-scale migration.

That is the tack taken by Glenn Madsen, a senior network management engineer at Pacific Bell's LAN Management Center in Dublin, Calif. He said his firm has upgraded about 40 users to NetWare 4.1 in what he called "a pure plug-and-play, problem-free installation."

Madsen and other network administrators emphasized that the NetWare 4.1 installation and/or upgrade requires someone with some technical experience on the level of "a good Certified NetWare Administrator to install NetWare 4.1."

Nonetheless, he reported Pac Bell's LAN Management Center has been using NetWare 4.1 "happily" since mid-February. "The upgrade was very smooth — much smoother than I anticipated," Madsen said.

"We elected to stay with NetWare 3.12 until they got it right. My job is not to be a testbed for Novell; it's to serve my customers. And with NetWare 4.1 they finally did. We didn't encounter any glitches, and it had all the features like [NetWare Directory Services] and data encryption features we need," Madsen said.

Perfect fit

Jim Basile, data processing manager for the city of Corvallis, Ore., had a similarly easy NetWare 4.1 migration. The municipality upgraded about 75 users on two networks in its Public Works Department and a third electronic-mail server to NetWare 4.1 without a hitch.

Like many users who made the leap, Basile did so because "NetWare 4.1 was functional and reliable" and provided the city with

NetWare Directory Services (NDS) capabilities for all its departments. "We have no horror stories to tell," Basile said.

On the contrary, NetWare 4.1 delivered all the functionality that the municipality was looking for, especially NDS's ability to modify objects and change directory tree structures.

"From a purely pragmatic standpoint, NDS means that me and my fellow network administrators no longer have to come into the office as often on off-hours. We're no longer staying late to manipulate file server structure to bring the file server down and back up to make moves, adds and changes," Basile said.

He said he anticipates directory services will also ease administration once the city begins to build directory synchronization between the Groupwise application and NDS this summer.

Some users, such as Paul Thayer, senior systems engineer at the Fasson Films division of Avery Dennison in Painesville, Ohio, were confronted with obstacles. Thayer had a problem when he attempted to upgrade a two-user runtime version of NetWare for a Digital Equipment Corp. Local Area Transport (LAT) 4.02 server to NetWare 4.1.

"The backward compatibility wasn't there. The NetWare 4.1 di-

rectory tree corrupted the data on the existing 4.02 directory tree. It caused the entire [network operating system] to become unstable, and about 30 users were unable to login for two weeks," Thayer said.

William Donahoo, director of marketing at the NetWare Products Division, said Novell expects that NetWare 4.1 support for NetWare for LAT will be available in the "May to June time frame."

A public service

But probably the most reassuring testament to the ease of migrating to NetWare 4.1 comes from a neighborhood librarian. Polly Gropen is the library director at the Delafield Library in Delafield, Wis. She was persuaded by an outsourcing firm and a network administrator at the local college to make the giant leap from NetWare 2.x to NetWare 4.1 to handle the library's massive databases and tap into the resources of NDS.

"The migration wasn't difficult at all. I learned everything I needed to know about NetWare 4.1 from watching our technician do the install," Gropen said.

And although the Delafield Library does not use all of the functionality of NetWare 4.1, she said the latest network operating system "will get me farther into the future, which is important because we're spending the taxpayers' money, and it's more cost-effective long term."

Picking up momentum

After a so-so reception over the past two years, Novell's NetWare 4.1 shipments have finally ramped up. It now accounts for 30% to 40% of the company's shipments since the product was officially released in December, according to The Burton Group.

For example, a Computer Intelligence InfoCorp survey of 4,250 large corporate NetWare shops in December and January found that 61% of the businesses would install NetWare 4.1 this year; 39% said they planned additional NetWare 3.x purchases.

Two factors are accelerating this migration to NetWare 4.1: Novell removed the 25% premium for upgrading from 3.x to 4.1, and large corporate users have awakened to the competitive advantage of NDS, said Stan Schatt, Computer Intelligence's LAN service director.

Computer Intelligence research from February through July 1994 revealed that 55% of 7,400 NetWare sites surveyed planned to install NetWare 3.x vs. 45% who intended to implement the 4.x platform.

"Less than a year ago, customers were resisting the migration to the 4.x platform. Now they're lining up for upgrades," Schatt said.

Lee Doyle, an analyst at International Data Corp. (IDC) in Framingham, Mass., agreed, noting that as of last December, there were 104,000 NetWare 4.x licenses installed compared with 1 million NetWare 3.x server licenses. IDC has not yet tabulated NetWare 4.1 shipments for the first quarter.

"NetWare 4.1 has decent momentum," Doyle said. "The question now is will the pent-up demand for NetWare 4.1 continue." — Laura DiDio

Options expand for legacy-LAN connections

By Patrick Dryden

To help join legacy SNA and expanding TCP/IP networks, IBM and a pair of connectivity pioneers are improving their channel-attached gateways this month.

Tapping directly into high-speed host channels is hot now, said one market analyst. This is because network managers are seeking greater efficiency for rising traffic levels.

"Years ago, we had to work at the protocol level with proprietary products to get TCP to talk to SNA. Now, by letting the vendors do the integration work, we can get back to the application level we need to deal with," said John DiNovo, a vice president at The Sabre Group, the information technology business of AMR Corp. in Fort Worth, Texas.

Last week, IBM came through with direct channel attachment options for its RS/6000-based gateway between SNA and TCP/IP networks. An upgrade to the latest version of AIX sets the stage for more powerful gateway servers, including symmetric multiprocessor systems that promise to off-load some CICS and DB2 applications to benefit LAN-connected users.

"For the first time, our channel connection supports both SNA and TCP/IP," said IBM product manager Julie Joyce. Version 2.1.2 of AIX SNA Server/6000 software supports the SNA Channel Connectivity feature, available for \$7,500 for either block multiplexer or Escon environments.

Taken together, they let an RS/6000 operate not only as an SNA physical control unit but also as an open platform for off-loading host applications.

"It's optimized for large volumes of 3270 traffic by taking advantage of the channel to spread out sessions, and it helps those who don't want to put TCP/IP on the host," Joyce said. "But this AIX server can run DB2/6000 and CICS/6000 as well."

IBM's combination can cut communication costs by eliminating controllers in the middle, but off-loading applications to the gateway would be pricey up front, said Tim Wilson, an analyst at Decisis, Inc., a consultancy in Herndon, Va. "You could see greater long-term savings from reducing communication costs and slashing [host] upgrade [costs]."

AIX SNA Server/6000 and gateway software now support Version 4.1.1 of the AIX operating system. Upgrades are free, and server software ranges from \$885 to \$7,080, depending on the processor.

First up

Other vendors that have beat IBM to the SNA-to-TCP/IP market have also enhanced their products.

OpenConnect Systems, Inc. in Dallas has added a small unit that joins IBM or compatible mainframes to popular Unix systems. It offers a single block-multiplexer channel interface for hosts and a standard SCSI interface for Unix servers. OpenConnection for Channel is available for \$18,995.

Apertus Technologies, Inc. in Eden Prairie, Minn., has extended its Datastar/Universal Access domain name server to support beyond its DataCenter Hub gateway. The load-balancing software now works with IBM's 3172 controller, the Apertus 6172 and Cisco Systems, Inc.'s Cisco 7000. Escon support will be added this year, according to the company.

"By letting the vendors do the integration work, we can get back to the application level we need to deal with."

— John DiNovo,
The Sabre Group



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Wang users keep the faith despite expected loss

By Neal Weinberg

At about the same time that Wang Laboratories, Inc. was announcing a loss for the quarter ended March 31, Frank Wesner was taking delivery of a top-of-the-line VS12000 superminicomputer from the Lowell, Mass., company.

Wesner, vice president of special systems development at National Insurance Services, Inc. in Tampa, Fla., has stuck with Wang for the past 12 years — through good times and Chapter 11 bankruptcy.

Holding on

"It doesn't bother us," said Wesner, referring to Wang's recent report that it will lose money when earnings come out later this month. He says he has confidence in Wang's ability to manage its turnaround, and he will continue to use Wang minicomputers to handle the company's claims processing operation.

Industry analysts, other Wang users

and the stock market all seemed to agree that even though Wang's streak of six profitable quarters has been snapped, the loss is a onetime hit rather than a sign of fundamental problems.

Of Wang's total write-off of \$75 million, \$65 million will be taken in the third quarter. The \$65 million charge will cover severance packages for 1,000 employees who will be let go as part of the acquisition of Groupe Bull business units earlier this year. But the company also said it would have lost a small amount of money even without the Bull write-off.

The financial news has not fazed John Rudasill, president of Carrier Computer Services, Inc. in Cherryville, N.C. "From my side of things, I don't have any problems at all with it."

In fact, Wang's \$160 million purchase of several Bull business units — but primarily its U.S. service operation — has been good news for Rudasill. The long-time Bull hardware and service custom-

er said that since the Jan. 31 purchase went into effect, "We're getting better coverage because there are more reps in the field."

The charges that Wang took are "in line with what you'd expect with an acquisition of this size," said Scott McCready, an analyst at International Data Corp. in Framingham, Mass.

McCready noted that Wang stock actually went up slightly, indicating that Wall Street is not overly concerned about the loss.

"Going forward, the future is pretty bright," McCready said. The service business generates plenty of cash that the company can use to develop workflow and imaging products.

One slow quarter is not enough to worry Morgan McKnight, systems engineer at Pacific Mutual in Newport Beach, Calif.

He is using Wang's imaging software in his paperless variable annuity department.

"But if we came to the next quarter and there was another loss, then it would suggest to me that something else is going on," McKnight said.

Revenue down

Another concern is that Wang's imaging and workflow business is not generating the kind of revenue needed to offset inevitable declines in

hardware sales and in servicing that hardware, said David Benhaim, an analyst at First Albany Corp. in Boston.

Benhaim said Wang has come late to the workflow/imaging market, faces formidable competition from IBM and FileNet Corp. and has "a credibility issue to overcome" as a result of the bankruptcy.

Saving bucks

Wang said it expects to save \$85 million a year in operating costs as a result of the layoffs and consolidations it has announced.

The big write-off

\$43M to cover severance pay for 1,000 workers

\$13M to write down certain assets

\$10M to relocate headquarters and cover systems integration costs

\$9M to eliminate redundant operations

DEC to expand Alpha reach

By Neal Weinberg

The main event at tomorrow's Digital Equipment Corp. extravaganza in New York will be the unleashing of TurboLaser, a monster server that Digital hopes will munch mainframes in its path.

But another machine, also to be announced tomorrow, could prove even more significant in Digital's fight to take on the other Godzilla servers. That box, code-named Gamma, is an upgraded version of the Sable 2100 departmental server — Digital's most popular Alpha machine — and is based on the company's 64-bit Alpha technology.

Offering significant improvement in performance, the standard Gamma will pack a 233-MHz EV-5 chip, which replaces the 200-MHz EV-4 chip in the comparable Sable. TurboLaser is Digital's long-awaited enterprise server that scales up to 12 microprocessors.

Martin Pitson, a network analyst at Corel, Inc. in Ottawa, has nine Sables running Microsoft Corp. Windows NT. He said he is looking forward to the Gamma server. "That was one of the reasons for buying the 2100 in the first place; it's easy to scale," he said.

Pitson noted that an upgrade from the EV-4 to the EV-5 chip is a breeze technically but not necessarily financially. "Upgrades are never cheap, shall we say," he said. Specific pricing on upgrades was not available as of press time.

Nevertheless, Pitson said he will try Gamma. And if it shows significant performance improvement over the Sable, he said he will upgrade his entire fleet.

The Sable, introduced last April, has become the flagship of Digital's Alpha line, with nearly 10,000 units sold, according to Terry Shannon, an analyst at Illuminata in Hollis, N.H.

Shannon said Digital is on a new product treadmill that may keep it ahead of the competition, but it may be moving too fast for users.

For example, the Sable came out last April, was upgraded in November and is now being boosted again.

For Steve Anderson, senior vice president of MIS at Best Buy, Inc. in Eden Prairie, Minn., that

kind of an upgrade path is too fast. Best Buy has 21 Sables running Windows NT in the back rooms of the firm's consumer electronics stores. He said he will not upgrade again because the relatively new Sables provide all the power he needs.

Shannon said Digital must continue to

freshen the product line and keep upgrade costs reasonable.

Despite that, many users said they are looking forward to the announcement, which will also reveal that Oracle Corp. is porting its database software to the Alpha platform.

 Digital fails to articulate software strategy to users. See page 67.

Alpha sales

Digital has sold more than 100,000 Alphas, with the ratio running at about 70% workstations and 30% servers.

Digital serves it up

MODELS	NUMBER OF PROCESSORS	ESTIMATED ENTRY PRICE
AlphaServer 2100/5/250 (Gamma)	4	\$60,000
AlphaServer 8200/5/300 (TurboLaser)	6	\$100,000
AlphaServer 8400/5/300 (TurboLaser)	12	\$200,000

Nextel, McCaw deal boosts radio net span

By Michael Fitzgerald

Jilted last August by MCI Communications Corp., Nextel Communications, Inc. last week found a replacement and then some in wireless billionaire Craig McCaw.

McCaw's decision to back Nextel, a wireless services provider, means the company's vision for an all-digital wireless voice-and-data network is likely to become a reality. This in turn is rekindling hope that nationwide mobile radio networks will become viable for corporate use.

"It's a resurrection of Nextel and the whole [specialized mobile radio] market," said Rakesh Sood, a technology analyst at Hambrecht & Quist, Inc. in San Francisco.

Voice and data

The integration of wireless voice with data should hold particular appeal for trucking and package delivery companies, which often dispatch information to drivers via both methods.

"If you're doing a fleet, [Nextel's concept] is great because you get voice and data in one package," said Lee Nolan, a senior telecommunications analyst at The Travelers Co. in Hartford, Conn. However, he said the Nextel network, once finished, would not offer companies like his the coverage levels

of the cellular network. Therefore, it would not be a viable competitor to a cellular network, he added.

Still, the dispatch market has great potential, especially in the eyes of McCaw. He and his family said they would invest \$315 million up front and as much as \$1.1 billion during the next six years in Rutherford, N.J.-based Nextel. If McCaw executes all his options, he would control nearly 24% of Nextel.

The money is crucial to Nextel, which is strapped as a result of growth plans and some large acquisitions made last year. These include a combined \$2.4 billion for its main competitor, DialPage, Inc., and Motorola, Inc.'s dispatch services. When MCI withdrew its proposed \$1.3 billion infusion for Nextel, the company was \$800 million short of its capital needs [CW, Sept. 5, 1994].

Analysts say the McCaw purchase not only makes the Nextel network viable but also restores the company's credibility.

"Nextel's been beaten up a lot, and quite rightly. They're the king of hype," said Iain Gillot, an analyst at Link Resources Corp. in Framingham, Mass. Gillot said that now "they have enough money to go out and do what they said they could do," referring to plans to build a nationwide voice-and-data network.

IS revamp

CONTINUED FROM COVER 1

Wednesday," said Charlie Feld, Burlington's acting chief information officer.

"But with the move to just-in-time, everything is much more customer-centered," he added. "We must deliver to tighter and tighter schedules."

Compared with many of its competitors, including archrival Union Pacific Corp., Burlington Northern has been slow to integrate various in-house systems. But analysts said that waiting may ultimately prove beneficial to the railroad because technology has improved so rapidly in the past few years.

"Increasingly, [Burlington] will see some of the same benefits other railroads have already seen," said Scott Flower, a railroad industry analyst at PaineWebber, Inc. in New York.

To meet more precise delivery windows, Burlington's 700-person information systems organization is deploying a new locomotive tracking system and a second scheduling execution system. Both run under a three-tiered architecture of desktop OS/2-based workstations and Unix-based servers linked to a mainframe running IBM's MVS and IMS and a centralized DB2 database.

A third computerized dispatching system developed by Pittsburgh-based Union Switch & Signal Co. runs on a Digital Equipment Corp. Alpha machine tied into the railroad's TCP/IP network. Using this system, dispatchers at the Fort Worth operations center will control signals and switches for the entire railway.

Cost justified

Taken together, the new enterprisewide systems replace several separate regional applications that formerly updated a central mainframe on a nightly and sometimes weekly basis.

Feld estimates that about 65% of 10,000 desktop workstations have been installed so far. The reconstruction project is scheduled for completion in 1997.

Feld would not disclose the cost of the project but said he expected it to pay for itself in one to two years.

One of the newer technologies Burlington is taking advantage of is miniature transponders for tracking cars as they roll throughout the rail system. In the late 1980s, many of its competitors developed tracking systems using bar coding.

"The problem was that paint would wear off, or the bar codes would get covered with dirt and snow so they couldn't be read at high speeds," Feld explained. So Burlington is equipping its cars with credit-card-size transponders, which

can be read at speeds exceeding 80 mph.

Having operated in such a disparate systems environment for decades, Burlington found getting to a common database a massive challenge. Overall, it took a cross-functional team of 18 people working full-time more than a year.

"There was a tremendous amount of data spread out all over the place. A large account could be maintained in 30, 40 or 50 different places," Feld said. "Our job [in IS] was to put the database structures

in place. After that, the marketing and finance people and other users had to get together and agree on where to put stuff."

Now, dispatchers in the operations center and staffers in the railroad's adjacent customer service center both access the same information but from different angles and via different interfaces that IS designed using C++ and Smalltalk development tools.

"Both groups are looking into the same

system," Feld said. "But where the [operations center] sees a train with 100 cars on it, customer service sees customers' shipments."

Another major challenge has been cutting over to the new system while simultaneously keeping trains running on time.

Within IS, Feld has assigned 45% of the 700-person organization to new development. A freeze has also been placed on fixing old systems.



Acting CIO Charlie Feld has assigned 45% of IS to new development

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CA buys into SQLBase

Deal with Gupta means cash influx; users win future Ingres link

By Kim S. Nash

Gupta Corp. announced last week that it has sold some source code rights to its SQLBase database for the next five years to Computer Associates International, Inc.

The deal provides Gupta with a \$7 million cash infusion, a \$10 million loan from CA and sundry other monetary promises.

CA's millions are most welcome at Menlo Park, Calif.-based Gupta, which lost \$23.9 million last year. The company is expected to post another loss when it announces financial results for 1995's first quarter late this month, analysts said.

The vendors plan to build a version of Gupta's SQLBase that can communicate with the Unix-based Ingres database, company officials said. CA plans to position that product, CA-OpenIngres/Desktop, as a Windows companion to the Unix-based Ingres database, which does not run on PCs.

But users should not expect to see a fully integrated hybrid of SQLBase and Ingres—at least not immediately—because the architectures of the two products are quite different, said Rich Finkelstein, an analyst at Performance Computing in Chicago.

"The most they can do is build a

gateway-type thing to do SQL translation to get the two talking," Finkelstein said.

Gupta and CA plan to develop CA-OpenIngres/Desktop for Microsoft Corp.'s Windows, Windows 95 and Windows NT and for IBM OS/2 systems.

CA declined to give pricing last week for the jointly developed products, saying it would announce license and support fees before the end of the month. That is when a driver to link CA's OpenRoad Ingres development tool kit to Gupta's SQLBase is due to ship.

Other promised features that would more tightly link SQLBase and Ingres include the ability to replicate data between SQLBase and Ingres. However, Sanjay Kumar, CA's president and chief operating officer, declined to specify a delivery date for those functions.

Some Ingres users welcomed the prospect of a Windows database. Healthcare Compare Corp.

in Downers Grove, Ill., could use CA-OpenIngres/Desktop on the laptops of its field staff, said Dan Rippeteau, director of data services. SQLBase already runs on laptops.

But the partnership does little for users seeking an Ingres-compatible database for Macintosh desktops, said Frank Pellegrino, manager of database applications and operations at Public Broadcasting System (PBS) in Alexandria, Va.

"Our big problem is that ... cross-platform support has always been limited," Pellegrino said. PBS is a longtime Ingres shop.

While SQLBase runs on Macintosh, Windows is the platform CA is targeting. PBS runs Macintosh and Windows PCs.

The deal is not a prelude to CA's acquiring the ailing tool maker, Kumar said. "A strong and independent Gupta is good for the industry, so we'll leave it at that for now," he said.



Electronic Data Systems Corp. recently added Ingres database and related software to a worldwide reseller deal it signed with CA late last year. The goal is "to make it very comfortable for EDS to use CA software in place of every other software package they've been using," said Alan Paller, CA's director of open systems, referring to databases from Oracle, Sybase and others.

widely implement those until 1997, he added.

Carl Greiner, an analyst at Meta Group, Inc. in Stamford, Conn., projected that Hitachi will sell up to 400 MVS-based Skyline machines during the next few years. The new line should be "very prof-

achi Data Systems Corp., Hitachi's marketing arm in San Jose, Calif.

The company hopes to charge as much as \$25,000 per MIPS out of the chute, Clark added.

However, that may be "a little high," said Charlie Burns, an analyst at Gartner Group. New IBM

ES/9000s are currently selling for about \$18,500 per MIPS and should be down in the \$17,000-per-MIPS range by the fourth quarter, he noted. At that rate, Hitachi's pricing would likely have to top out at about \$22,000 per MIPS, according to Burns.

While it may cost more than System/390s, Skyline promises reduced maintenance, energy and floor space expenses because it

uses both emitter-coupled logic and CMOS devices, according to Burns.

Hitachi only supports eight processors, while IBM and Amdahl offer 10 and 12, respectively. But Skyline's 780 MIPS maximum throughput will still easily outpace IBM's 468 MIPS peak and Amdahl's 530 MIPS limit, analysts noted.

Hitachi

CONTINUED FROM COVER 1

performance, Neuser said. On the other hand, the speed increase that Skyline promises could be useful, and the bank plans to evaluate the Hitachi machines after they ship in the fourth quarter, he added.

Closer look

Kaiser Permanente Foundation Health Plan, Inc.'s Northern California data center will also look "pretty seriously" at Skyline for a capacity expansion expected in early 1996, said Al Alioto, director of resource management at the Walnut

Creek facility. "We still see a need for big engines to process our CICS [transaction] workloads," he said.

Kaiser wants to "get our feet wet" next year with both CMOS-based hardware and IBM's technology for linking multiple mainframes together in a so-called parallel sysplex, Alioto said. However, it probably will not be able to

The biggest iron of all	
Hitachi's new Skyline Series mainframes will include the following features:	
Processors:	1 to 8
Throughput range:	124 MIPS to 780 MIPS
Processor memory:	256M bytes to 12G bytes
I/O channels:	32 to 384
Footprint:	52.7 sq. ft. to 95.8 sq. ft.
Availability:	Fourth quarter

itable for them" and will help break Hitachi's image as a slavish follower of IBM on technology, he said.

Because Skyline stands by itself on uniprocessor throughput, it should fetch "a slight premium" over competing water-cooled systems, said John Clark, executive vice president of marketing at Hit-

Lotus makes suite move

CONTINUED FROM COVER 1

dows 3.1 applications.

Analysts familiar with Lotus' strategy said the company desperately needs to do something to set its suite apart from the competition, but this new strategy appears to miss the mark.

"This isn't why people buy desktop software," one previewer said.

While vendors are increasingly pushing groupware as a selling point for their suites, it actually contributes very little to current buying decisions, said Andy Froning, managing editor at National Software Testing Laboratories in Conshohocken, Pa. He said Lotus is pushing the groupware aspect because "the SmartSuite and Notes integration is the only thing that Lotus has going for them."

"Notes and the desktop suite are completely separate decisions," agreed Joe Caruso, manager of technical strategies at Smithkline Beecham PLC. Most of the PCs at Smithkline's U.S. headquarters in Philadelphia run Microsoft Corp.'s Office, even though the facility is a large Notes site.

"It's fairly simple," said Simon Levin, an analyst at Gartner Group, Inc., a Stamford, Conn., consultancy. "Microsoft has a word processor and spreadsheet. Lotus has a spreadsheet. That is how suite decisions have been made."

While groupware integration will not necessarily sell desktop software, users expect the integration to come as a standard feature with the next round of suite purchases.

The stakes are high for Lotus. Despite a media blitz heralding the team computing concept, a sour note

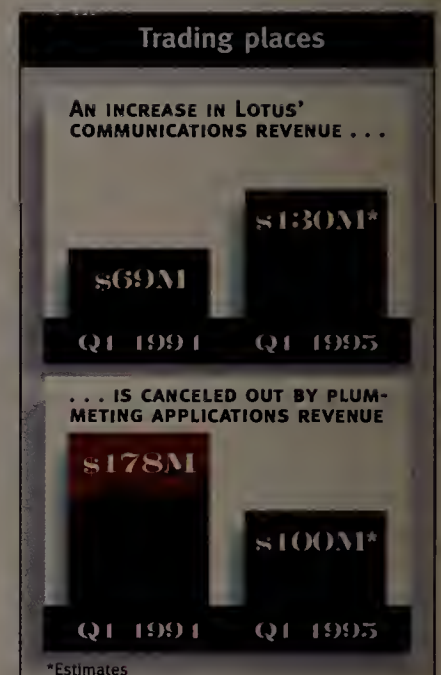
could expedite the downward spiral of its applications business. Last week, several Wall Street analysts cut their earnings estimates for the first quarter ended March 31 down to the break-even point based in large part on rumors that desktop sales were flat. Lotus will announce its results April 19.

Lotus has never captured more than 15% of the suite market, and its desktop effort has been haphazard during the past year, with three different executives heading up the business. Delays of key applications last summer also caused damage. And once the applications shipped, they still did not stop the loss of market share to Microsoft.

The missteps have been costly. Market figures from International Data Corp. in Framingham, Mass., and Dataquest, Inc. in San Jose, Calif., indicate Lotus lost suite market share in 1994 while Microsoft and Novell, Inc. realized a gain (see chart).

And the competition is only heating up. Instead of fighting it out for second place with a hapless suite from Borland International, Inc., Lotus faces a much-improved version of PerfectOffice from WordPerfect, the Novell Applications Group. Tightly integrated with at least two top-end applications and with channels leveraged by WordPerfect and Novell, the newest suite is moving closer to the No. 2 position.

"Resellers are telling me that Novell [and its PerfectOffice suite] is gaining market share at Lotus' expense," said Michael Wallace, analyst at UBS Securities, a New York investment bank.



Source: Wall Street analysts

Microsoft touts its 32-bit Office applications suite. See page 41.

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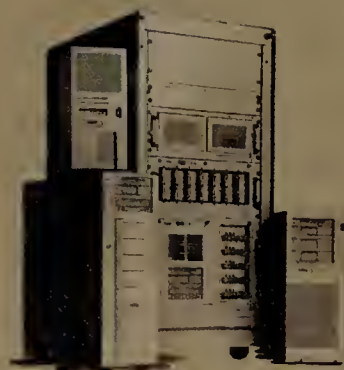
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Fig. 1 Backbone

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COMPAQ

Users: Object success requires global plan

By Elizabeth Heichler
NEW YORK

Corporate developers at last week's Application Development conference here cited object-oriented technology as crucial to enabling information systems to produce systems that can meet ever-

changing business needs in a timely fashion. But they also cautioned that a lack of investment in top-down planning is a problem.

Building up libraries of reusable business objects — or code modules — can help shorten development cycles and eliminate redundant efforts. But despite

the strategic benefits of building an enterprisewide object infrastructure, the tactical nature of application development means enterprisewide benefits are often sacrificed for the immediate needs of a particular business unit, several corporate developers said.

"The pressures against [enterprise in-

frastructure building] are that each business case has to be self-funding," said Tom Robben, vice president of application architectures in the securities services group at New York financial firm JP Morgan. Budgetary pressures on IS departments mean that few will get the research and development dollars needed to establish a corporatwide object model. This situation can force IS managers to build a "stealth infrastructure," constructing pieces of it project by project, Robben said.

Business groups are "interested in solving problems they face, not in building an infrastructure solution — there's no payback for them," said Steven Chanin, manager at Sapient Group, a Jersey City, N.J., developer of financial applications.

"You've got to find someone who's willing to pay to build the highway," he said. The problem, he added, is that individual business units "just want to pay for the driveway" linking them to the highway.

Another cultural issue that may keep corporatwide benefits of object technology at bay is that there are few incentives for programmers to reuse object components, users said.

One way to encourage programmers to incorporate existing components into their applications is to purchase high-quality commercial-class libraries "to convince people that these things work," said Richard Bielak, a developer at Credit Agricole Lazard Financial Products in New York.

Meanwhile, the proliferation of rapid application development (RAD) tools can negatively impact the development of reusable components, even though most vendors of these tools position them as object-based, according to Dave Linthicum, technical director of systems and computer services at Mobil Corp. in Fairfax, Va.

"The first thing that gets tossed out the window in a RAD session is reuse — you're not programming from the generic to the specific," Linthicum said. "Every RAD tool is promoting [object-oriented techniques], but if you're going to dummy up an application — and they're encouraging developers to do that — the first thing you throw aside is good applications design."

While business pressures push IS into creating local solutions, redundancies and divergence are created on a global scale, Robben said. Strategies to minimize that include developing generalized global systems that can be localized and building up stocks of reusable components.

But for these object-based techniques to work, Robben said, IS must intercept development projects early. Currently, JP Morgan is able to get only 20% to 30% of projects to "slow down and get it right," he said.

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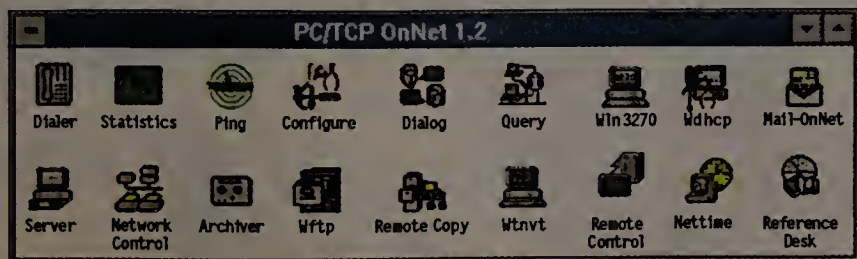
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Unisys parallel systems target commercial users

By Neal Weinberg
ANAHEIM, CALIF.

Unisys Corp. offered some appetizers at its recent Unite user group show here, but it is saving the main course for a late April extravaganza in New York, when it will announce a new line of parallel

processing computers.

The parallel processing initiative, which the Blue Bell, Pa., company has been developing with Intel Corp. since August 1993, represents Unisys' bid to bring the technology from the technical to the commercial marketplace.

"On paper it looks good," said Jeffrey

L. Ehrlich, senior vice president of technology at National Data Corp. in Atlanta. But Ehrlich said bells and whistles are of secondary importance. "The results are what matter," he added.

"I take a hard line. If it can beat the other guys in a given application, that's the extent to which we'd be interested in it,"

Ehrlich said. His shop handles more than 2 million electronic health care claims a day and is one of the largest U.S. processors of bank checks.

Two issues dwarf the technology, Ehrlich said: One is the rest of the package, which includes training, support and service; the other is cost. "You get pragmatic in a hurry when you try to explain things to the CEO," he said.

Unisys is onto something with its plan to lash together multiple high-performance Pentium processors in a single box, said Howard Richmond, an analyst at Gartner Group, Inc. in Stamford, Conn.

"I believe parallel processing is one of the great growth areas for information technology for the rest of this decade," he said.

Unisys engineers have taken the backplane from Intel's Paragon line of Pentium-based supercomputers and brought it up to the standards that a large commercial user would expect in terms of design, packaging and power, Richmond added.

Benefits abound

The advantage of parallel processing, he said, is that users can manipulate huge relational databases and conduct complex queries more easily than with a traditional mainframe. And parallel processing systems have a scalability that allows them to ramp up as the amount of data increases.

With a price tag that could run into the millions of dollars, depending on the size of the system, Unisys will target its mainframe customers, Richmond said.

Richard Justice, executive vice president and chief technology officer at the NASDAQ market system in Washington, said parallel processing is "a good direction" for Unisys.

Justice is not ready to write an order, but he said Unisys will "probably do a good job with it."

The challenge for Unisys will be to get its message out, said Robert G. Simko, an analyst at International Technology Group in Los Altos, Calif.

He added that the parallel processing initiative helps the company dispel concerns among users that its corporate shift to information services means that it is abandoning technology.

Unisys showcased a number of new products at Unite: a diskless workstation and slim notebook from their PC line, laptops and storage systems.

It also displayed its MK9000 line of kiosks for voter registration, driver's license renewal, tourist information, bill paying and retail use.

Also taking part in the exhibit was USoft, Unisys' server/client software unit, which it created to develop open systems software products as a complement to the company's move to client/server computing.



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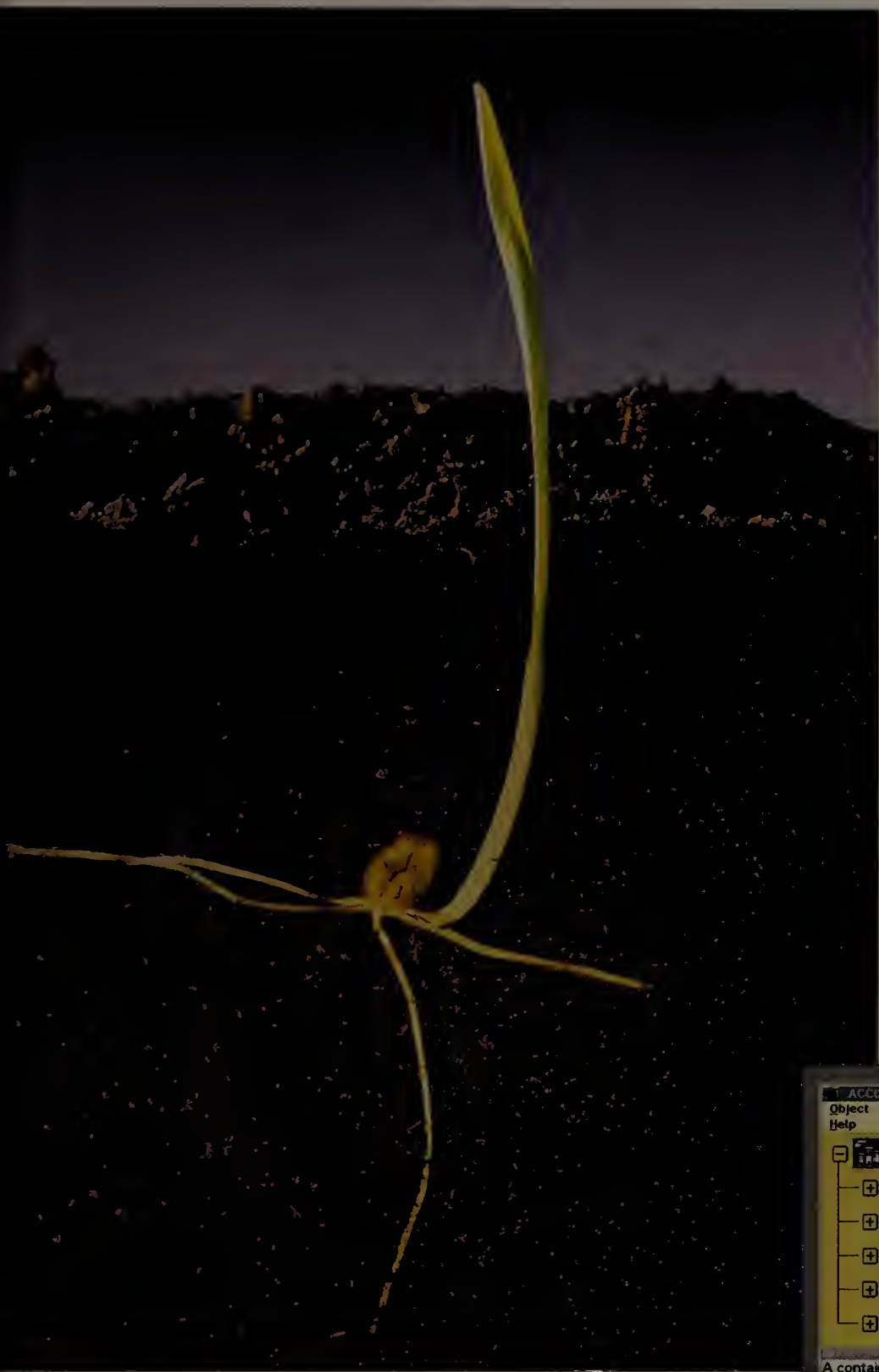


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Lessons from a lawsuit

Charges against consulting firm raise red flags

By Julia King and Thomas Hoffman

A ruling may be months away, but a \$100 million fraud lawsuit filed recently against Andersen Consulting does offer valuable lessons in how to avoid botched consulting projects in general.

Lesson No. 1: Never leave contractors to work exclusively on their own — insist that some in-house developers be part of the project. Lesson No. 2: Negotiate all costs up front. And lesson No. 3: Ask questions — lots of them — early and often.

The suit against Andersen stems from work the \$3.4 billion consulting giant performed at UOP, an 80-year-old, \$800 million engineering company that develops technology used to build oil refineries. In 1992, UOP hired Andersen to streamline its engineering specification and cost-estimating processes and develop a series of client/server software applications.

Three years later, UOP President and Chief Executive Officer Michael D. Winfield claimed that "the difference between what Andersen promised us at the outset and what it actually delivered is staggering."

What went wrong

UOP's recollection of the relationship is studded with warning signs of potential problem areas.

"From the beginning, we were not included in the actual development process," said Eugene Schmelzer, director of support systems centers at UOP. "Andersen kept us at arm's length and insisted on using their own staff for coding and software work."

"They also kept reestimating the number of man-hours it would take to complete the project," Schmelzer said.

Also problematic was Andersen's deployment of inexperienced staffers, who ultimately delivered incomplete, defective and largely unusable systems, according to the UOP suit.

"Many of the things they gave us were software modules that were incomplete, and we couldn't even run tests on them," Schmelzer said. "The way it was coded made it impossible to maintain the software over the long run."

Meanwhile, Andersen's periodic progress reports to UOP indicated all was going swimmingly, according to UOP officials.

Andersen last week said it would not respond to specific allegations. In a statement issued immediately after the suit was filed March 21, Andersen dismissed UOP's allegations as "completely

without merit."

Of the half-dozen former or current Andersen clients contacted, some were not altogether surprised by the charges, especially those about the Andersen consultants' alleged lack of expertise.

Yet others noted that this problem is not exclusive to Andersen. Other consulting companies also have deployed relatively inexperienced personnel to projects, managers said.

"Consulting and services is 100% people-based. You could have great success in New York and an absolute disaster in Los Angeles, and it is the same firm," said an executive at an Andersen competitor, who spoke on the condition of anonymity.

Other complaints

Other Andersen clients characterized unplanned time extensions

as commonplace on their projects, and some complained about Andersen's often undisciplined approach to projects.

In September 1994, First Union Corp., a Charlotte, N.C., bank with \$77 billion in assets, selected Andersen to head up a call center project. But the bank ended its \$6 million contract with the consultancy after the first phase was completed on March 13 because the work "had become a struggle to complete," said Judge Fowler, senior vice president and director of systems development at First Union.

The problem, Fowler said, was that Andersen did not manage the initiative "with the appropriate project disciplines." However, he added that First Union shared some of the blame for the project's poor start. He also noted that Andersen's yearlong work on an unrelated commercial banking re-engineering project has been satisfactory.

"We've learned that projects don't do well when you expect someone else to manage them," he said.

Lon Winton, director of information systems at Union Pacific Resources Co. in Fort Worth, Texas, also believes in heavy monitoring and management of outside consultants. To avoid problems, companies must establish their authority and set limits, he said.

Union Pacific engaged Andersen on a fixed-price basis in 1992 to perform what Winton described as "classic business systems and technology planning."

"There were some differences in opinion about what might be the best long-term choice of technology, but in the end it was our decision," Winton said. "If you abdicate [decision-making] responsibility, I'm not sure what right you have to second-guess later what was done."

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MCI opens doors to king of cybermalls

By Ellis Booker

The opening of MarketplaceMCI, a secure environment for Internet shopping and the largest such "cybermall" to date, topped the Internet-related announcements at the recent Interop/Networld '95.

Noting the long-distance company's substantial marketing might, observers predicted the MCI Communications Corp. offering will do much to legitimize the use of the public Internet for secure commerce.

"What they've done is package all the ingredients and given it a name," said Paul Callahan, director of network strategies at Forrester Research, Inc. in Cambridge, Mass.

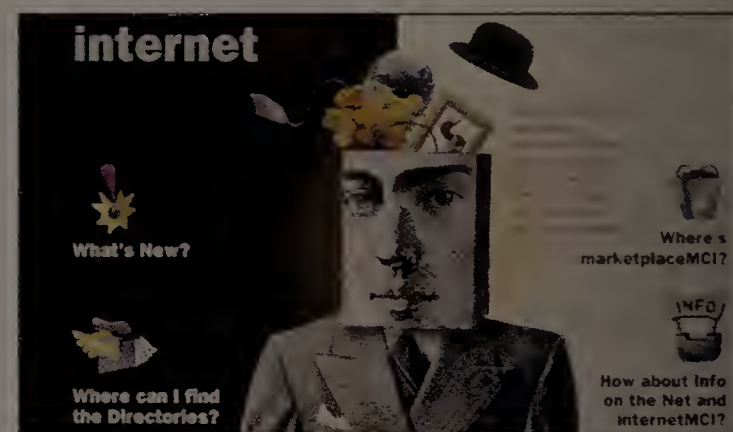
MCI's approach will make it hard for information systems directors at Fortune 1,000 companies to avoid Internet strategies. "You can no longer dismiss the Internet as a techie, dangerous playground," Callahan said. "MCI's marketing is going to make it appear to the consumer [to be] hot, fast and safe."

Fourteen consumer and business marketing companies have opened for busi-

ness at the site, which is accessible through MCI's home page (<http://www.internetMCI.com>). A second round of 15 "storefronts" will be added this spring.

Larry vanGoethem, director of systems support and telecommunications at Sara Lee Corp. in Chicago, said the MCI offering is just one of a number of possible venues in cyberspace.

"We already do a reasonable amount



MCI's InternetMCI home page guides on-line shoppers to MarketplaceMCI's 14 stores

Ring in

With Dave Dorman, Pacific Bell's chief executive officer, declaring the Internet "the data equivalent of basic telephone service," the San Francisco-based company last week became the first regional Bell company to join the ranks of Internet access providers.

Next month, the company will begin providing Internet services to business customers. Dedicated transport and access will start at \$525 per month.

The offering will feature transport options including frame relay, DS1 (1.544M bit/sec.) circuits, Switched Multimegabit Data Service and Asynchronous Transfer Mode cell relay at speeds of up to 45M bit/sec. By the end of the year, Pacific Bell will add switched access of up to 28.8K bit/sec. and Integrated Services Digital Network.

The service will initially target business markets in California in the San Francisco Bay area, Los Angeles, San Diego, Sacramento and Orange County.

— Ellis Booker

Here's the deal

MCI officials said most of the customers it has signed up for MarketplaceMCI likewise want MCI to handle building Webs and maintaining Web servers.

"From a financial standpoint, it generally makes more sense for us to do it," said Karl Lewis, senior manager of Internet applications at MCI.

Charges to on-line merchants will vary depending on the complexity of the installation but will range from \$25,000 to \$100,000 per store. "Store owners" also pay monthly rents ranging from \$2,000 to \$10,000, as well as transaction fees.

The heart of MarketplaceMCI is at MCI's 24-hour data operations facility in Virginia, where the company has installed more than 20 Unix servers to handle functions such as mail, authentication, news and transactions. The servers are arranged on twin 100M bit/sec. Fiber Distributed Data Interface networks and connected to the public Internet over redundant DS3 — or 45M bit/sec. — lines.

MCI is working with Netscape Communications Corp. in Mountain View, Calif., to develop security for the service by implementing Netscape's secure client and server software.

 Silicon Graphics announces a 3-D Web browser. See page 54.

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NetWare Network Management. Easily the most manageable network.

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One of the greatest concerns about any network operating system is how secure it is. NetWare 4.1 includes RSA security, the industry's most secure password encryption and digital packet signature technology. In fact, it was designed to meet the National Computer Security Center's Class C2 Network Security criteria. Look. If you can't afford to have confidential data in the wrong hands, that's reason enough to upgrade your network to NetWare 4.1 today.

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NetWare 4.1 shares the same industry leading file system as NetWare 3, except it also comes with terrific, industry leading enhancements. There's a server-based file compression feature that can double the size of the hard drive, leaving more room for data. And sub-allocation provides more efficient storage. It also provides optional large block sizes which speeds data transfer performance from hard drive to memory. And data migration reduces storage media costs by transparently migrating data to near-line or off-line storage. You know, this is a great way to avoid having to shell out the big bucks for more space later.

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All you need to know is the name of the

NetWare Return on Investment. It makes sense on your bottom line.

NetWare 4.1 has the lowest cost of ownership in the industry. In fact, the META Group reports NetWare 4.1 can cut 25%[†] from the cost of managing a network. Think of it. That means your NetWare 4.1 upgrade or new purchase will virtually pay for itself in no time. Here's a chance to make the accountants smile for once.

NetWare 4.1. All this and much, much more.

NetWare 4.1 also comes with everything you need to run your network on TCP/IP, so you can run IPX or TCP/IP throughout your network. It also has built-in support for your Macintosh users. And built-in System Fault Tolerance level III capabilities. (To activate this service, all you have to do is simply purchase a license disk and you can reduce the chances of network failure to almost zero. And because it's built-in, there's no need to reload your system).

Still, we know all these features wouldn't mean diddly if they didn't work right out of the box. So we submitted NetWare 4.1 to rigorous testing—first we tested it at Novell labs, then the press took a crack at it, and finally, our toughest customers got their chance. It passed with flying colors. Without a doubt, NetWare 4.1 is set to take center stage in the industry.

We hope we've told you enough to get things underway. But in case you need more information about NetWare 4.1, just call Novell at

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7 Key Services	NetWare 4.1	NetWare 3
1 DIRECTORY Global directory service	YES	NO
2 INTEGRATED MESSAGING	YES	NO
3 MULTIPROTOCOL ROUTING	YES	Add-on product
4 NETWORK MANAGEMENT Graphical user tools provide view of entire network	YES	NO
5 NETWORK SECURITY RSA public/private key Restrict login to specific Mac address Security auditing	YES YES YES	NO NO NO
6 FILE SYSTEM AND STORAGE Support for data-migration hardware, data compression and disk block suballocation	YES	NO
7 NETWORK PRINTING	256 per print server	16 per print server
Additional Services		
● INTEGRATED SYSTEM FAULT TOLERANCE LEVEL III	YES*	Add-on product
● CLIENT SUPPORT AND INTEROPERABILITY NetWare for Macintosh, Number of user licenses included Graphical user tools	Included in Netware user licenses YES	5 NO
● WAN SUPPORT Network link Service Protocol™ (NLSP)™	YES	Add-on product
● ARCHITECTURE Maximum number of user connections per server Nondedicated server Single login to network Additive licensing	1,000 YES** YES YES	250 NO NO NO

printer and you're set. That's it. Plus, NetWare 4.1 Print Services maximizes your hardware investment because it allows up to 256 printers to run off one server (as opposed to NetWare 3, which limits you to 16 printers). Just think how much time, money, and hours of frustration this could save you.

Briefs

StorageTek sees loss

Storage Technology Corp. in Louisville, Colo., will report a loss for its first quarter due to layoff costs and last month's purchase of Network Systems Corp. Analysts had expected a profit of about \$8 million.

Conner sues IBM

Conner Peripherals, Inc. filed a second lawsuit against IBM last week, seeking to bar IBM 2½- and 3½-in. disk drives from being imported to the U.S. Conner's initial patent infringement suit sought to prevent the manufacture of the drives. ThinkPads, portable computers and some desktop and workstation PCs offer the drives.

Stock suit settled

Compression Labs, Inc. settled a class-action shareholders suit for \$4.8 million. Chief Executive Officer John Tyson attributed the suit to the company's declining stock price in 1992. He said the agreement was favorable because it was uncertain if the company would have prevailed in a trial.

Copyright suit filed

Berkeley Speech Technologies, Inc., which licenses its speech synthesis technology to Franklin Electronic Publishers, Inc., filed a copyright infringement suit against Franklin for \$30 million. Franklin is charged with harassing other licensees and trying to have their products seized by U.S. Customs.

SHORT TAKES Delrina Corp. expects lower profits and sales, about \$3 million short of projections for the quarter ended March 31. . . . Platinum Technology, Inc., has acquired RelTech Group, Inc. in Fairfax, Va., a developer of relational-based data repository software. . . . Chip maker NexGen, Inc. filed an initial public offering of 3.4 million shares of common stock, with an \$11 to \$13 price range.

Sybase announces drop in sales

By Kim S. Nash

Sybase, Inc. plans to explain this week why it fell roughly \$20 million short of forecasted sales in its most recent quarter — an unwelcome surprise that spurred a massive stock sell-off last week.

Sybase issued a one-paragraph warning last Monday that said preliminary sales results for the quarter would be \$213 million to \$216 million, far below expectations (see chart). Investors quickly ditched more than 32 million Sybase shares the next day, driving the stock price down 41%, from \$39.13 to \$23. Sybase stock rebounded slightly to \$25.82 a share as of late last week.

Slower-than-anticipated database server license sales ap-

pear to be the primary factor behind Sybase's relatively low growth in its first quarter of 1995, said Stu Schuster, executive vice president of marketing at Sybase in Emeryville, Calif.

"There's no doubt that we missed the projections by a mile," Schuster said. "But we don't believe there was any one thing" that caused sales of Sybase's flagship System 10 database to slow. Schuster and other Sybase officials declined to elaborate, saying they would provide a more complete analysis this week when they post final figures for the quarter.

While database license sales grew at roughly 30% for the first three months of the year, the pace was far slower than anything Sybase or Wall Street had expected. That kind of sur-

prise, particularly related to a core product line, is a bad omen, analysts said.

Rich Edwards, an analyst at San Francisco brokerage Robertson Stevens & Co., said he is "skeptical about Sybase's ability to reaccelerate server revenue growth without . . . System 11." He was referring to a major database upgrade, which is expected to include better multiprocessing capabilities than Sybase's current product.

System 10 does a good job handling symmetric multiprocessing systems of up to four CPUs. But past that, the database's performance suffers, according to users and analysts. Sybase plans to rearchitect its core database engine with System 11 to support eight or more processors [CW, Oct. 17]. A beta-test version of System 11 is due out this summer, with general availability planned

Red alert

Sybase's warning last week of a surprise sales drop spurred a massive sell-off of its stock

First-quarter 1995 sales

Original estimate \$233M*

Sybase's revised estimate \$213M to \$216M

*From Robertson Stevens & Co., San Francisco

for late this year.

In fact, weak parallel processing features have forced some Sybase users to buy other databases for projects that call for powerhouse computing. For example, MCI Communications Corp. recently brought in Informix Software, Inc.'s OnLine database for a giant data warehousing application it has in the works [CW, March 20].

 Sun Solaris users finally get Sybase 4.9.2. See page 54.

IBM pulls out the stops to bolster OS/2

Gerstner orders top executives to lobby software developers for support

By Lisa Picarille

Considered by some to be a last-ditch effort to rally support for OS/2, the letter IBM Chairman Louis V. Gerstner recently sent to 100 of his top executives instructed them to promptly contact the "world's Top 1,000 software developers with a clear and consistent message: OS/2 is a strategic product for IBM."

However, IBM's attempt to show major commitment to OS/2 is being viewed as too little, too late by some developers. Over time, the number of key developers backing OS/2 has dropped off. Lotus Development Corp. remains the one stalwart.

"It's a pathetic last resort," said Vadim Yasinovsky, president of Clear Software, Inc. The small, Newton, Mass.-based developer markets a popular Windows-based flowcharting program. IBM has never approached it about creating an OS/2 version of its product, he said.

Gerstner's edict requires IBM's top executives, from Gerstner to divisional vice

presidents, each to chat up 10 independent software developers about the business opportunities for OS/2 Warp. Other IBM employees will conduct follow-up calls, according to Howie Hunger, director of relationship management at IBM's solution developer operations in White Plains, N.Y.

Gerstner's letter underscored the need to act quickly. "Windows 95 is months away — assuming Microsoft meets its latest schedule — so the time to act is now," the letter said. Microsoft Corp. said it is sticking to its August delivery date.

"IBM might have been able to get a foot in the door a couple of months ago when the ship date for Windows 95 was less certain, but now publishers are focused on Win 95 as their first priority," said Jeff Silverstein, editor of the "Software Industry Bulletin," a newsletter in Stamford, Conn.

"We are not doing OS/2 applications because it is difficult to make a business case for it. Windows has a much larger installed base," said Morgan Brown, a product man-

ager at Visio Corp. in Seattle.

"Why aren't they calling my customers and telling them about the benefits of OS/2?" asked Mike Campbell, chief executive officer of Campbell Software, Inc., a labor scheduling software developer in Evanston, Ill. "There is absolutely a business opportunity with users who need a robust pre-emptive multitasking system to run mission-critical applications. However, IBM is doing very little to play up that angle."

A big effort

Under this latest recruitment effort, developers will receive IBM's entire set of Developer Connection tools at no charge, a copy of OS/2 Warp, free electronic developer support from IBM and training at an IBM education site. IBM will also help developers support their products, Hunger said.

IBM officials claim more than 2,500 applications are currently available for OS/2, including recent OS/2 offerings from independent software vendors such as Computer Associates International, Inc., Frame Technology Corp., Sybase, Inc., Corel Systems, Inc. and Macromedia, Inc. All of these vendors are committed to doing versions of their software for OS/2 Warp as well as OS/2 for the PowerPC, which is due out this summer.

The following excerpt is from Louis Gerstner's letter mandating the Executive Call Program:

"Share with [key developers] our confidence in OS/2. Let them know that IBM offers tools and expertise to help them develop OS/2 applications today. Help them see how they can take advantage from OS/2's success."

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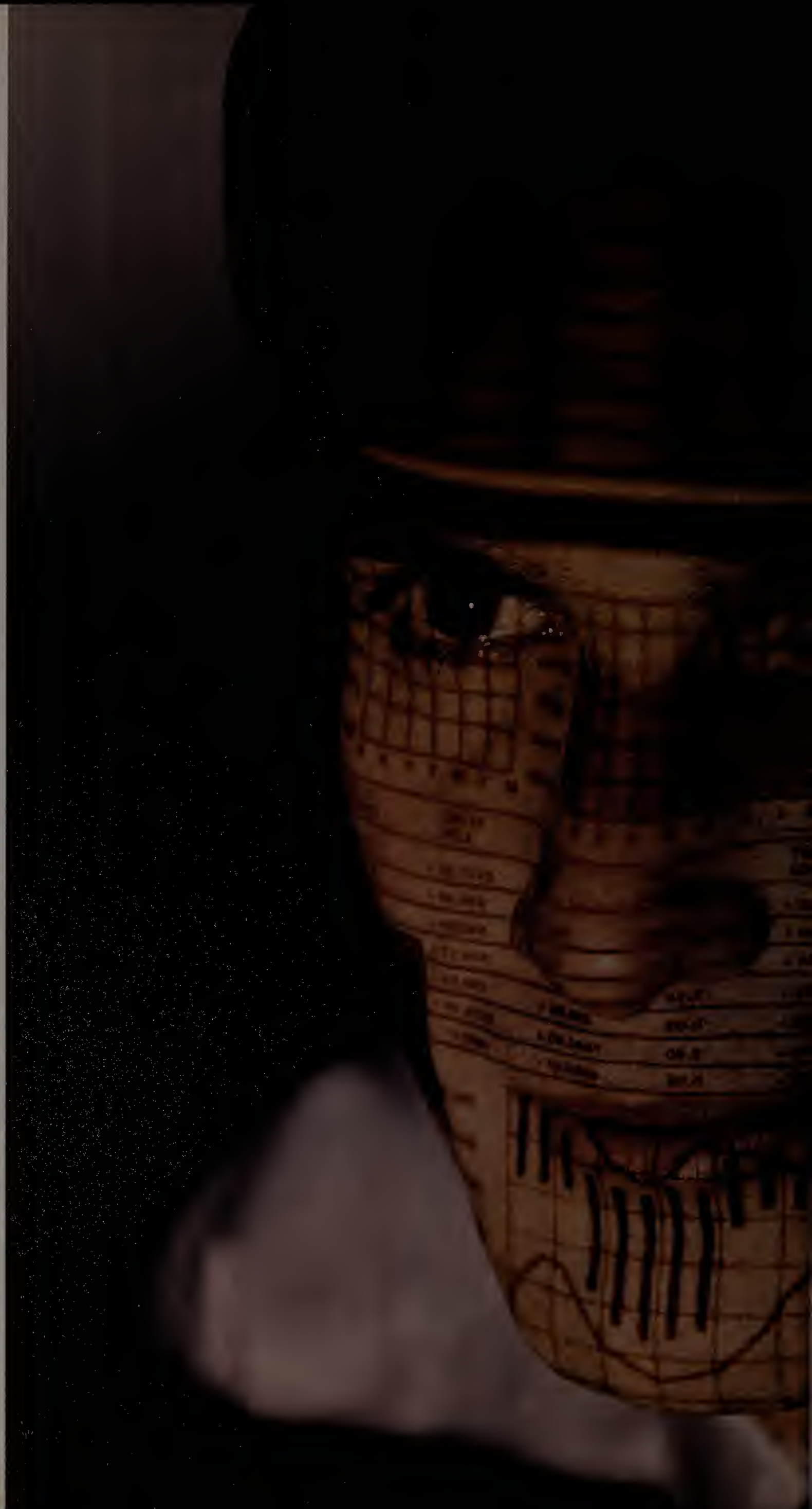
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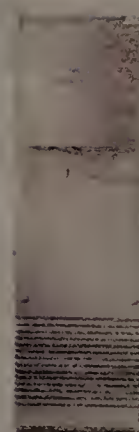
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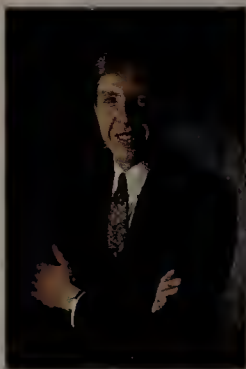
Editorial

Yours and OURS

You support the Salvation Army because it's good for people in need, your church because it's good for your community, your college because it was good for you. Now it's time to support an organization that's genuinely doing something good for users.

The awkwardly named but well intentioned Open User Recommended Solutions (OURS) group has a chance to give users something they truly need in this wild open systems world: a voice. But the all-volunteer organization is fighting a two-front battle: for membership and over just what it wants to be when it grows up. I hope it decides to be very grown up indeed because the industry needs a group like this.

OURS has the potential to do for the open systems industry what Guide, Inc. and Share, Inc. have long done for the IBM user community: promote vendor technology and business practice standards that benefit users. Its hatchet is an impressive roster of mammoth end-user members, including some of the country's biggest banks. When OURS speaks, vendors listen.



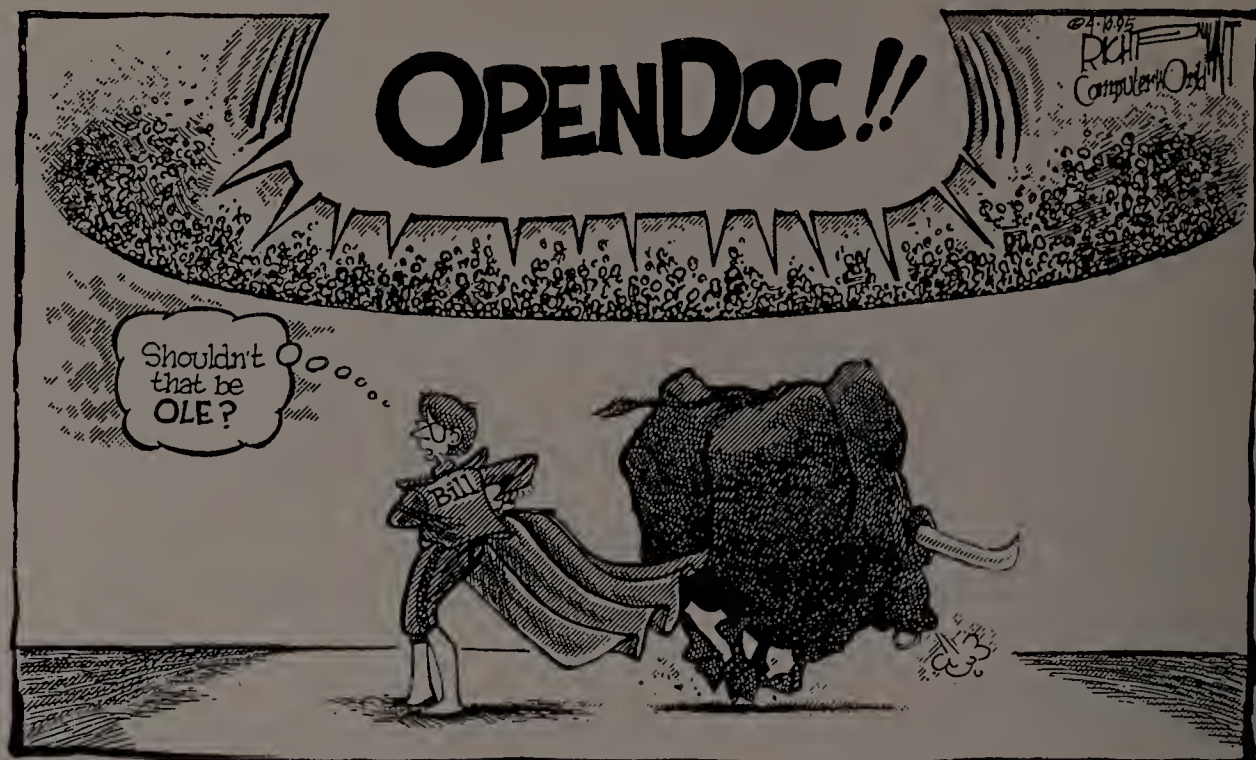
Take software licensing, for example. The profusion of software licensing options introduced by vendors in the past couple of years has created an unholy mess for users in the distributed systems world. Last fall, OURS stepped in with an intelligent and simple model users can employ to weigh different pricing models and pressure vendors to comply. The framework is intuitive and sensible, and it's free.

The group, which met last week in Salt Lake City, plans to deliver similar framework documents this year for electronic messaging, directory services, network management, security administration, object technology and end-user support. It hashes out these documents, (which are mercifully short, by the way) in committees made up of users and vendors working in a partnership to which both sides appear very committed. Maybe the lion *can* lie down with the lamb.

But OURS risks becoming just another marginal special interest group unless it starts swinging for the fences. The group isn't sure whether it wants to bulk up membership and become an 800-pound gorilla in the open systems business. It does not belong to any industry standards groups, and it carefully refrains from praising or pummeling specific vendors in its publications. It is solidly committed to its vendor partnership philosophy. That's a laudable principle, but it can also lead to watered-down compromise positions if users don't take a forceful enough role.

Users need to support OURS and encourage it to take a more forceful stance in the industry. You need an 800-pound gorilla that you can call your own. The group can be contacted at (212) 938-5534.

Paul Gillin, Editor
Internet: pgillin@cw.com



TurboTrouble

I was interested to read "Computers trip up tax man" [CW, March 27]. I wonder if anyone has investigated whether there is a correlation between the 19% drop in returns processed electronically from last year and the numerous customer service and shipping difficulties experienced by Intuit this year. As a user of TurboTax, I can say that it was impossible for me to file my return earlier because of delays in receiving the software. Perhaps this accounts for some part of the drop in returns.

Audrey Kalman
San Mateo, Calif.

SGI already there

Your article about the HP 7200 chip ["HP servers: Price pleases, speed dismays," CW, March 27] left out one fact that might be valuable.

Silicon Graphics with the Mips Technologies R4400 chip is at a 200-MHz clock speed and offers far greater price/performance than Sun or Hewlett-Packard.

Silicon Graphics systems are already at a 64-bit architecture and can scale up to 36 CPUs with the uniprocessor starting at \$16,000.

Steve Cooper
Silicon Graphics, Inc.
Farmington, Mich.

Single log-on solution works

Regarding "Group pushes single log-on idea as security antidote" [CW, March 27], single log-on is not a new problem. In fact, a powerful solution is available. The Open User Recommended Solutions (OURS) forum recommends allowing users to use the same userID and password for all log-on processes (PC, network, E-mail, databases, midrange systems, mainframe systems). If users have only one userID and password to remember, they're less likely to write it down where someone else might find it. But users are still required to repeatedly enter the same userID and password for every new system they access.

Perhaps OURS should take a look at the Open Software Foundation's DCE Security and Ker-

beros. Kerberos is a trusted authentication, authorization and encryption service that runs across a wide variety of platforms and operating systems. It was designed as part of Project Athena at MIT and is secure enough to withstand the onslaught of even the most dedicated MIT hackers. This technology allows you to log on once to DCE Security, which then automatically authenticates you and checks your authorization to perform any action anywhere throughout the network. Why not allow users to log on once and only once and still have an extremely secure distributed computing environment?

Anne Thomas
Open Environment Corp.
Boston

Room for more than one

In "Web servers move in different directions" [CW, March 27], you see conflict where there is none. You quote unnamed experts saying that the Secure Socket Layer (SSL) vs. Secure Hypertext Transport Protocol (SHTTP) Internet security debate will favor SSL. It is not an either/or question.

SSL is a network-level security scheme. It has the advantages of simplicity and flexibility. It has its place.

SHTTP is an application-level security scheme designed to solve a different set of problems. SSL allows credit-card numbers to be transmitted securely across the network. SHTTP obviates the need for credit cards: It makes contractual exchanges possible.

Christian Mogensen
Stanford, Calif.



Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products

☐ Yes

☐ No

Networking Products

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(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products

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☐ No

Networking Products

☐ Yes

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Evolution of a species

James Martin

You've seen the headlines, read the books and heard the discussions. The traditional roles, responsibilities and career paths of today's information technology professionals are in the midst of massive upheaval in the face of widespread business re-engineering and technological change.

The corporation of the future, or "cybercorp," will be significantly different from the one you work at today. Re-engineering will almost certainly affect your job, perhaps even eliminate it. But as information technology increases its power to change business, the best professionals will become more valuable, not less. And they will be more highly paid.

Some information technology jobs will be eliminated, but newly created positions will replace them, and opportunities within information technology will continue. Your ability to survive this inevitable change depends on mastering the critical skills that will be required of an information technology professional in the year 2000. Critical skills are not learned quickly; therefore you must act now to ensure a prosperous and long-term future. Keep in mind that many old Cobol programmers who thought they had skills to last a lifetime are now driving taxis.

Obtain knowledge of diverse technologies. The mastery of new technologies is critical to the cybercorp.

Almost everyone likes to attach themselves to a "hot" technology as a means to ensure their job security. The danger has always been that what is hot today may quickly become tomorrow's doo-doo. The critical skill will not be expertise in a specific technology but rather the ability to invent new business mechanisms. Information technology should be able to do that better than business folks.

Adapting to constant change

Develop enterprise engineering expertise. Business process re-engineering by itself is not enough. Organizations must adopt the principles of enterprise engineering to be viable and successful in the face of a constantly changing, uncertain environment. Enterprise engineering is a family of disciplines for a constantly changing enterprise that goes far beyond business process re-engineering. It facilitates business invention, systems renewal and solution delivery as an integrated set of ongoing activities. The ongoing goals of enterprise engineering are profit and beating the competition, not reports. By understanding and facilitating enterprise engineering concepts, you are an invaluable resource to the company.

Know the business and how to model it. Everyone concedes that information technology's traditional glass house environment is extinct. Still, many information technology professionals are sitting at their computer terminals with tunnel vision, refusing to embrace or even acknowledge the business environment in which they operate.

Your value as an information technology professional depends on your ability to marry advanced technologies with processes. This requires skill at building models of work activ-

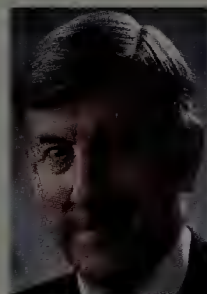
ities in order to plan and simulate the continuous redesign of processes. You must know the business policies and rules of the organization to be able to successfully model their impact.

Speak the language of business. In the cybercorp there will be no clear distinction between business functionality and information technology. Your value depends on your ability not simply to bridge the gap between processes and technology but to eliminate it completely. This can be achieved by working hand in hand with the business manager. You must be an equal participant who raises business opportunities through technology. Put away your endless lists of acronyms and buzzwords that comprise "tech talk," and speak in terms of the business.

The wave of the future

The following are a few of the trends in technology that you must prepare for:

• **Multimedia graphical interface.** The GUI



A sampling of the factors that IS professionals must prepare for today if they want to prosper in the cybercorp of the year 2000:

- ▶ *Multimedia graphical interface*
- ▶ *Object-oriented modeling*
- ▶ *Component-based systems*
- ▶ *Corporate nervous system*
- ▶ *Distributed systems, information and databases*
- ▶ *Navigating in cyberspace*
- ▶ *A vision for the future*

will be replaced by much richer, more sensory multimedia user interface (MUI). The advent of the MUI requires you to have a deeper understanding of human factors engineering and a stronger sense of style. The successful information technology professional will not only know how to use development tools but how to create with them.

• **Object-oriented modeling.** Corporate object engineering is required to establish the enterprise's class libraries. Object-oriented modeling represents workflow in terms of objects that must link seamlessly to the design of systems and the high-level generation of object-oriented code. Repository-based object-oriented tool kits will replace CASE tool kits using structured techniques. With object-oriented programming, you no longer need to be an expert programmer, but you must be a proficient modeler of processes and be able to break down those processes into individual, reusable work units.

• **Component-based systems.** Most of tomorrow's applications will either be purchased off the shelf or assembled from components using high-level methods generators. Tomorrow's

cybercorp will need to build new business applications more quickly and modify them even faster to avoid maintenance nightmares. Component-based systems provide more flexibility than fixed packages. In a component environment, information technology professionals will build prototypes quickly, participate in joint application development workshops and rapidly assemble the systems from templates, objects and generators.

• **Corporate nervous system.** The cybercorp will require a nervous system that interlinks every desk and computer in an organization, regardless of geography, hardware or application. The nervous system also must extend beyond internal boundaries to trading partners, suppliers and customers. Infrastructure, interoperability and networking expertise is needed to design, build and manage such systems. Middleware will be critical.

• **Distributed systems, information and databases.** As data becomes more of a commodity, it is information that gives a company a competitive edge. The key is getting the right information to the right people at the right time. Your understanding of distributed client/server systems, relational databases, decision-support applications and complex data analysis hold significant value for your employer.

• **Navigating in cyberspace.** In accordance with the hype, or actually in spite of it, the Internet will fulfill its promise as an information superhighway. You need to become a skilled cyberspace navigator, helping users find information, software and other resources of value. Beyond the identification and gathering of information, effective cyberspace navigation will be necessary for marketing, finance and overall daily business communications.

• **A vision for the future.** Too many corporations are in trouble because they lack vision and a strategic direction for the enterprise. Or, if a company has a strategy, it fails to adequately consider the impact of technology. Your understanding and insight of how technology will change the business environment is critical to top management's ability to develop an invigorating vision of where the corporation is heading.

Just as businesses are guilty of operating without a clear vision of where they want to go, so too are many information technology professionals. Individuals are often content working day to day as they always have without a coherent personal strategy. Unless you know where you want to go professionally, you will never get there. Only by continually revisiting your goals and expectations and challenging your assumptions about your skills and the demand for your services, can you hope to achieve success.

Don't allow yourself to become the next generation of taxi drivers. Act now to develop the critical skills needed by the year 2000, and your career in information technology will be long and prosperous.

Martin is founder and chairman of James Martin & Co., a management and technology consulting firm dedicated to transforming business through information technology.

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Desktop Computing

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IN PC MARKET, 41

Mac technology lands farther from the tree

Power 6100 serves dual environments

By Jeffrey Gordon Angus

Most big organizations have Intel Corp.-based computers as an overall standard and some departments where Macintoshes are the norm. Transferring work and files between them is possible but tricky.

Apple Computer, Inc.'s Power Macintosh 6100 DOS Compatible is a true Macintosh and DOS/Windows clone that is native to both environments. Its technological success seems unquestionable, but it poses potential cultural problems for low-end users.

The configuration we tested came with 16M bytes of RAM, a

505M-byte hard disk, a PowerPC 601/66 processor, an AppleCD 300i double-speed CD-ROM drive and the usual Apple read-only memory. It has LocalTalk capability as well as Ethernet on the motherboard and a SmartDrive — a floppy that reads both DOS and Macintosh disks.

The DOS compatibility card carries a 486DX2/66 processor, 16-bit Sound Blaster support and a slot for a single in-line memory module (SIMM) panel providing up to 32M bytes of RAM dedicated to the DOS/Windows side of the system. The shared hard drive comes with System 7.5 and DOS 6.22 installed

Power Mac, page 49

Customers welcome clones but with touch of skepticism

By Lisa Picarille

The Macintosh clones are on their way, but some customers are skeptical that the knock-offs, due to arrive in August, can be as good as the real thing. Other observers, however, said that the "Macettes" are bound to take off over time.

The first crop of Power Macintosh clones will appear from the likes of Radius, Inc. and DayStar Digital, Inc. They will target users in the high-end publishing, graphics and video markets.

"Personally, I'm a little skeptical," said Dennis Bonifer, a graphic artist at *The Herald Dispatch*, a newspaper in Huntington, W. Va. "I will stay away from them at first. Apple has been around, so I trust them, and it seems like the first year or so of the clone there could be compatibility problems."

Others were also tentative about purchasing Macintoshes not made by Apple.

"I'm certainly watching and looking at the Mac clones," said Mark Munro, corporate Macintosh network manager at the New York office of Jack Morton Productions, Inc., which specializes in creating corporate training materials. "But at this time, I wouldn't really go for it. I'm just so used to Apple. Apple is just Apple. You know them and trust them."

Brand loyalty to Apple is a big issue with avid Macintosh fans. But some industry observers said that same brand loyalty could work in favor of the clones.

"We already use a lot of Radius technology to soup up our Macs, so this is a natural progres-

sion," said Peter Speek, co-owner and president of Warren Miller Entertainment, a Boulder, Colo., film production company that is beta-testing the Radius System 100. "We are very

The Macintosh clone crop

Company:	Radius	DayStar Digital
System name:	Radius System 100	Genesis (single processor) Genesis MP (multiprocessor)
Design:	Tower/Apple 8100	Tower/Apple 8100
Target market:	Publishing	Publishing
Chip:	PowerPC 601	PowerPC 604
Price:	Less than \$12,500	\$5,000 to \$10,000
Ship date:	August	August

familiar with their peripherals and accessories and trust the company, so there are no concerns that the systems are not going to work correctly."

The lure of pricing

Next to the issue of compatibility, users were most concerned about pricing for the machines. Most said they would welcome the competition in the Macintosh market if it helped to lower prices. "Price is a big consideration, especially if the performance and reliability are the same," Munro said.

"Users will be skeptical until the kinks are worked out, but give them a big price incentive and people will try anything," said Jeff Matthews, general partner at RAM Partners LP, an investment fund in Greenwich, Conn.

Matthews said he expects the Macintosh clone vendors to successfully exploit the same

Clones, page 44

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■ Apple's first system equipped with DOS right out of the box is a perfect machine for people who work in both Macintosh and DOS or Windows environments. It will pose the same training challenges as any other operating system.

■ We found impressive performance and no compatibility problems in any routine business application on either the DOS/Windows or Macintosh side, but motion video performance was average.

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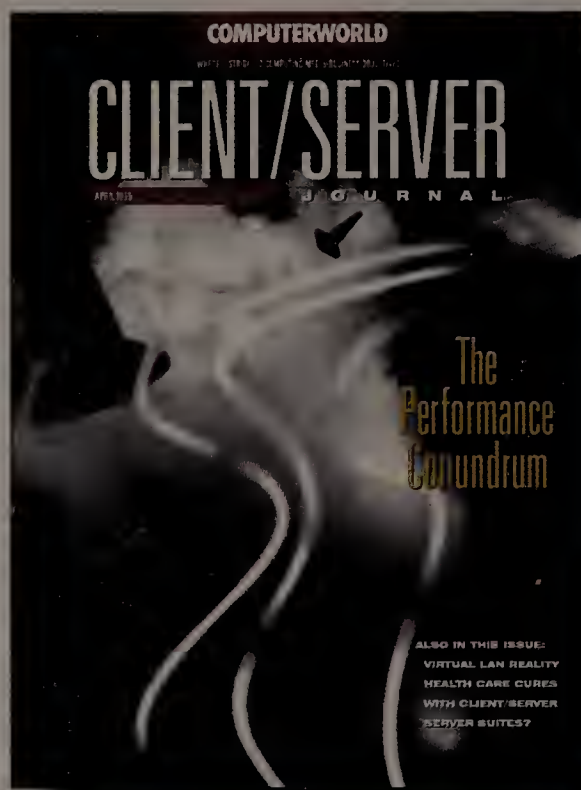
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Coming in the April and June issues...

April 1 Issue



Cover Story: Performance Planning

What are organizations doing to ensure that their new distributed systems perform at levels that exceed those of the legacy systems they're displacing? *Computerworld Client/Server Journal's* April issue examines the technologies, managerial issues and fine-tuning techniques that go into this planning process.

Vertical Market Focus: Health Care

How are hospitals and HMOs using the distributed computing model to revamp their business processes?

Product Focus: Database Management Tools

Our Test Drive feature takes a look at Personal Oracle 7. Firing Line reviews Sybase database management tools.

Don't miss our new Careers Column... a regular feature premiering in the April issue.

In this issue we profile a mainframe programmer's trials and tribulations in moving to a client/server programming environment.

Cover Story: Client/Server Goes Global

What are multinational companies doing to ensure consistent client/server implementations across their far-flung enterprises? This cover story in our June issue examines what type of technologies, tools and strategies these companies are using to create successful global deployment and how they are overcoming the cultural challenges inherent to each country they are implementing that strategy in.

Vertical Market Focus: Retail

Having survived a period of rampant consolidation, the retail industry is pulling out of the recession and ready to invest more in distributed computing. Where do retailers go beyond just "client/serverizing" their point of sales systems?

Product Focus: Application Development Tools

Our Test Drive feature looks at Borland's Delphi and Firing Line examines Informix New Era.

Careers Column: Computerworld editor Joe Maglitta's account of attending a week long "bootcamp" on client/server training.

June 1 Issue

Ad Close: April 12

**COMPUTERWORLD
CLIENT/SERVER
JOURNAL**

Where distributed computing meets business objectives



My Computer



Network
Neighborhood



Recycle Bin

You find
answers.

Sometime
you are
the **ANSWER.**

The question is,
WHAT COULD
YOU DO with
the right tools?



Start

 WordPad



The less
YOU HAVE
the

 Exploring - Windows

PLANNING FACT:



The system helps users help themselves. It's more intuitive. It's easier to use. It has built-in networking. And it's more reliable.

With Windows 95 you stay ahead of the curve. How did you get along without it?

TO HELP each INDIVIDUAL

more you can help everybody.

Easier Network Integration

The Microsoft® Windows® 95 operating system lets you spend less time worrying about network integration issues. Right out of the box, Windows 95 supports all major networking protocols. It includes full 32-bit, protected-mode versions of TCP/IP, IPX/SPX, and NetBEUI, and full Novell® NetWare® and Windows NT™-based clients. With vendor-supplied additions it supports Banyan® VINES®, DEC® PATHWORKS™, SUN® NFS and more. Your network clients are faster, more reliable, and use no

conventional memory. Backup agents for most popular server-based backup systems are built-in. Windows 95 also lets you run management and configuration tools remotely. Much of the troubleshooting you've done in person can now be done over the network.

Greater System Reliability

Windows 95 can reduce downtime and support calls through better use of the system's resources. It isn't a layer on top of MS-DOS®. It is a

complete operating system with 32-bit, protected-mode subsystems to keep your PCs running. So there's little chance of Out of Memory messages and your existing Windows-based applications can be run more reliably. The new Win32®-based applications offer an even greater level of reliability with separate memory address areas and separate message queues to prevent them from interfering with each other.

Simplified User Interface

Windows 95 makes navigating the system easier for every user. There are fewer concepts to learn, a more consistent, more intuitive layout and improved, unified, on-line help. Users find answers to their questions without having to call you. With long file name support, users can find files more easily. The Start button offers a single, streamlined point of access for nearly everything they want to do. A taskbar is always visible so switching applications is a snap.



WINDOWS 95 IS DESIGNED TO WORK WITH THE HARDWARE YOU ALREADY HAVE. IT RUNS AS WELL AS WINDOWS 3.1 ON A 386DX WITH 4 MEGS OF RAM, AND EASILY OUTPACES IT WITH A MORE POWERFUL PROCESSOR OR MORE RAM.

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Users
want

YOU WANT

 Exploring - Windows

PLANNING FACT:



Bring Windows 95 to the desktop and you can bring balance to your organization. You can customize and automate installation. You can control nearly everything from your desktop. You can let multiple users share a single PC. Nobody's the wiser. Everybody wins.

FREEDOM CONTROL.

Centralized Control

Windows 95 gives you one simplified, unified, "mini-database" for all your configuration files. The Registry eliminates the confusion of config.sys, autoexec.bat, .INI files, etc. It allows user-specific settings, like personal desktop preferences and network access. It includes PC hardware-specific settings. It includes system policies, which allow IS professionals to control configuration and override user settings.

Remote Control

You can install the Windows 95 operating system on your users' PCs without leaving your desk. Control which parts of the system you install, and automate the procedure. You can decide who has network privileges, access to control panels and even which applications users have access to. The Registry lets you efficiently manage and support each of your user's desktops. You can change individual user preferences and privileges. You can make global

changes that affect all users. You can remotely monitor systems and performance for more efficient troubleshooting. By using network management applications designed for Windows 95, you can access the Registry locally and remotely. Windows 95 includes agents for management standards such as Remote Procedure Call (RPC), Simple Network Management Protocol (SNMP) and, shortly after release, Desktop Management Interface (DMI).

Crowd Control

You control network access from a single location, where validated user logon is authenticated by the security structures of Windows NT Server and Novell NetWare. User Profiles allow different users to log onto any connected PC and see "their own" desktop. Each name and password retrieves a user profile from the Registry, dictating desktop layout, fonts, network connections, shared resources and access privileges to applications and data. Users can work productively anywhere on the network.



WINDOWS 95 IS DESIGNED TO WORK WITH YOUR EXISTING MS-DOS-AND WINDOWS-BASED APPLICATIONS AND DEVICE DRIVERS.

WordPad



The
YOUR users

the faster

Exploring - Windows

PLANNING FACT:



Now everybody on your network can work faster. Work smarter. Work together. Work whenever they want to work. From anywhere on the network. Get information wherever it's located. Even if they're not in the office. Quickly and easily.

faster

**CAN DO what
THEY HAVE TO DO,**

they can do what they want to do.

Faster Computing

Windows 95 gives your users new ways to get things done. Procedures are simplified. The interface is more logical. It takes fewer steps to accomplish many tasks and even less time to figure things out. With Windows 95, users can accomplish more. Preemptive multitasking and multi-threaded applications let them work on several things at once. The Win32-based application programming interface and OLE give a new generation of applications unprecedented speed and power. Usability Sciences, Inc. found

that users finished tasks in nearly half the time they required in Windows 3.1.* Plug and Play goes a long way toward eliminating disruptions for you and your users. Windows 95 recognizes changes made to hardware and reconfigures itself, without rebooting. Even systems that need reconfiguration regularly can be managed automatically. Plug a notebook PC into a docking station and the system automatically adjusts all new settings. Mobile users can change PCMCIA cards as easily as, well, changing cards.

Take A Shortcut

Windows 95 allows users to create shortcuts in the tangled world of the network. Once a resource is located, they simply create a desktop icon and in one click they're there. Create a simple, intuitive desktop that gives users one-step access to resources they use all day. Shortcuts can then be e-mailed between users without burdening the network and server with multiple copies of routed documents. Users can even drag a shortcut from the upcoming Microsoft Network online service.

Remote Possibilities

Dial-up Networking (remote access services) lets users on the road connect quickly and easily to frequently used networks. Desktop layouts of mobile computers look exactly like the PCs in the office, including shortcuts. And every time a person connects to or disconnects from the network, selected files can be automatically updated. Microsoft Exchange offers remote, as well as on-site users, a one-stop location for viewing and working with all types of information, from electronic mail and faxes to documents and public folders.



USABILITY SCIENCES, INC. FOUND THAT AFTER A BRIEF SELF-GUIDED TUTORIAL, USERS WERE ABLE TO PERFORM COMMON TASKS NEARLY AS QUICKLY ON WINDOWS 95 AS ON WINDOWS 3.1 DURING THEIR VERY FIRST ATTEMPT. AND BY THEIR THIRD REPETITION, USERS WERE NEARLY TWICE AS FAST.*

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Microsoft

WHERE DO YOU WANT TO GO TODAY?

* Source: Usability Sciences Study, October 1994

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32-bit Office takes on high expectations

By William Brandel

In an effort to demonstrate why users should upgrade applications to Windows 95, Microsoft Corp. has begun pulling back the curtain on the 32-bit version of its own applications suite, Office for Windows 95.

The new suite will include at least two versions — a standard version and a souped-up Professional version.

The standard package will include Word, the PowerPoint graphics package, the Excel spreadsheet and Schedule+. The Professional version will include all these packages as well as the Access database and the Bookshelf CD-ROM reference library.

Schedule+ is a Messaging Application Programming Interface-compliant group scheduling product. Bookshelf is a mix of reference software and includes a thesaurus and a dictionary. Office for Windows 95 users can pull down information from the CD-ROM as if it were already loaded in the suite, said Robbie Bach, director of product marketing at Microsoft's desktop applications division.

Office for Windows 95 has just entered limited beta testing and is slated to ship within 30 days after Windows 95 ships, Bach said.

Microsoft claims the suite runs an average of 20% faster than the old one. Bach also said users would note a remarkable speed improvement in the new applica-

tions in Office for Windows 95.

Still, it is unclear if users will be enticed to upgrade their current versions of Office.

"I don't see any benefit from having to upgrade the entire group of applications to Windows 95," said Carolyn McKenzie, PC software manager at Miller Brewing Co. in Atlanta. "I mean we always want our software to run faster, but I'd rather upgrade add-in applets than the whole suite."

Because Miller now has CD-ROM drives on its server, the company liked the idea of having Office users access Bookshelf applications from their desktops, McKenzie said.

Put to the test

Users and analysts said they would have to test Office and see the benefits for themselves before jumping on the Office for Windows 95 bandwagon.

"If you're happy with your current version of Office, what is the reason to upgrade?" asked Jeffrey Tarter, publisher of "Soft Letter," an industry newsletter in Watertown, Mass. "The simple answer is that Microsoft will have to create a bandwagon effect."

Microsoft, stressing uniformity among the products, is also changing all the version numbers of the products in the suite to Version 7.0. Each product currently

has its own version number such as Word 6.0 and Access 2.0. Bach also said all the products would be available within 30 days of one another. In a previous version of Office, Microsoft included vouchers so that users could upgrade specific applications at a later date.

However, not everything will be uniform across the Office products. For example, while Word and Excel will use the same file formats as the current 16-bit versions, PowerPoint's and Access' file formats will change, Bach said.

Current PowerPoint users will receive

a filter to view the new PowerPoint files. Bach said users will need to load the PowerPoint filter into their existing versions of Office to view the new file formats.

This is not expected to have a large impact on users because only a fraction

of Office end users actually use the PowerPoint application. According to a 1994 study on suites conducted by International Data Group in Framingham, Mass., only 31% of users at corporate sites use presentation graphics; 90% use word processing.

Microsoft is also making some changes to the Visual Basic Application Edition programming in the Office applications. Microsoft is putting Visual Basic into Access but taking it out of Word; Excel will

continue to use Visual Basic. Bach said this decision was based on Microsoft's belief that most users are programming in Access and Excel.

The decision to move Visual Basic programming tools out of Word did not sit well with at least one Office user.

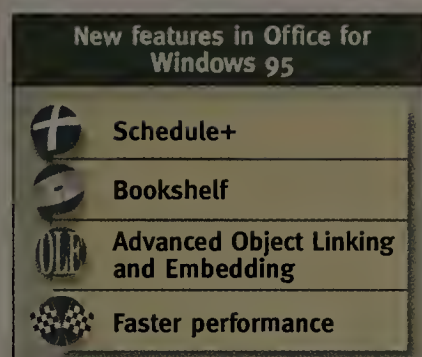
"If they start playing games with Visual Basic and moving it into other applications, it will give us fits, to say the least," said Michael McSorley, information systems manager at McCarthy Building Co. in St. Louis.

But McSorley said the hardware requirements to run Office for Windows 95 concerned him more than the Visual Basic issue.

Bach said current Office users who upgraded to Windows 95 would see no speed loss even if they do not increase the RAM in their desktops. But he acknowledged that if users run more than three applications simultaneously, they will need to upgrade beyond the minimum 8M bytes of RAM that Microsoft claims is necessary to run the suite.

A recent survey by International Data Corp. in Framingham, Mass., estimated that end users will run an average of 15 Windows-based applications on Windows 95.

Microsoft is pushing the speed improvements and tighter integration as reasons for users to upgrade from the current and very successful 16-bit version of Office 4.x. Office 4.x has captured more than 75% of the applications suite market.



New product line leads Unisys' lofty PC goal

By Neal Weinberg

With a slew of new products and a beefed-up marketing campaign, Unisys Corp. is shooting for a Top 10 finish in the PC sweepstakes this year. But analysts said that at best, the Blue Bell, Pa., company faces a difficult climb from its current position at around No. 20 because the market is so fiercely competitive.

Unisys recently introduced a PW Advantage Series built around Intel Corp.-based PCs and a diskless workstation aimed at banking and financial services. The company has taken what was an isolated product or two about a year ago and created a fully rounded line, from notebook to server.

Bruce Halvorsen, manager of marketing communications at the Unisys PC division, said the company has sold PC products all along but did not take a serious run at developing and marketing a full product line until about a year ago.

Tony Saputo, director of systems architecture at Alexander and Alexander, Inc., a New York-based insurance brokerage, is typical of the users Unisys is targeting. His company already uses Unisys products, and he decided to go with Unisys PCs mostly because of the vendor's service and support, he said.

Saputo has been buying Unisys PCs for almost a year and is ramping up to spread 3,000 units — a combination of laptops and 486-based PCs — throughout the company's U.S. offices.

Jack Gold, an analyst at Meta Group, Inc., in Stamford, Conn., said Unisys' market opportunity is to pitch

a high level of PC support and service to its large corporate accounts. "You can push a lot of PCs that way," he said.

Many of those customers do not mind paying an extra \$50 or \$100 per box, Gold said, if they are comfortable with the company's ability to fix the machines.

Out of reach

Gold said Unisys will increase its PC sales, but he is skeptical about the company's ability to reach its Top 10 goal.

Brian Jeffrey, an analyst at International Technology Group, Inc. in Los Altos, Calif., suggested that as Unisys' PC revenue increases, it can provide "a useful niche business."

In the corporate world, where Unisys has the best chance for success, it is running up against established players such as Digital Equipment Corp., IBM, Compaq Computer Corp. and Hewlett-Packard Co., all of which regularly upgrade their PC lines. In the open, down and dirty PC market, Unisys should face even tougher competition if it attempts to move into more price-sensitive areas such as the reseller channel.

In fact, even among the company's loyal customers, price and quick availability are becoming key factors in

purchasing decisions. And the Unisys strategy of delivering customized products within five days of order is costing it business.

Rick Zizak, information systems manager at Millcraft Paper Co. in Cleveland, is a longtime Unisys user with a bunch of Unisys PCs. But nowadays when he needs an additional box, he needs it immediately.

"They say they can deliver within a few days, and maybe to them that's OK," Zizak said. But PCs are a commodity now, and Zizak will typically run out to a computer superstore and buy a Digital PC instead of ordering through Unisys.

Gerry Hendrix, vice president of technical services at National Health Systems, Inc. in Englewood, Colo., said he has a Unisys mainframe and is considering buying another one. But when it comes to PCs, "the last time I looked they were a little overpriced," Hendrix said. Unisys' new products include a high-end, 100-

MHz Pentium-based PC/entry-level server that costs \$3,260 to \$5,400 and a midrange PC that starts at \$1,300.

George F. Thomas, senior vice president and director of data processing at New York Clearing House, said he is a happy Unisys mainframe user but also a happy Dell Computer Corp. PC user. He said he looked at the Unisys laptops but decided Dell offered better value.

Unisys' diskless workstation

Function: High-volume on-line transaction processing applications

Processor: 100-MHz Intel i486DX4

Memory: 4M bytes to 64M bytes

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IBM PC Server 500:

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Clones

CONTINUED FROM PAGE 39

lower-price strategy used by the PC clone makers. For example, when Dell Computer Corp. first started, it challenged Compaq Computer Corp. by offering comparable but less expensive systems.

But for some Macintosh users, price is secondary to the added value of being

able to purchase a machine tailored to their high-end needs.

"In the past, you had to build out on Apple's system to get better performance," Speek said. "Now Radius is giving you that performance off the shelf."

Another advantage may be the willingness of reportedly disgruntled Apple dealers to readily embrace the Macintosh clones.

"It's going to be a no-brainer for dealers to carry them," Matthews said. "Ap-

ple has screwed over the dealers so many times by changing policies — like threatening to cut them out by going direct — that there is a great willingness for the channel to take a look at the clones."

An Apple spokeswoman disagreed. "The channel is the primary interface between us and our customers," she said. "We are committed to the reseller channel, and we do everything to make sure we treat our resellers fairly."

Industry watchers initially expect the

systems to take a small bite out of Apple's core markets of publishing and graphics, but not to have a significant impact on Apple's presence in the small business and consumer areas.

On the other hand, Apple's decision to finally license its proprietary Mac OS is expected to help Apple expand its overall market share a little, some analysts said. Apple currently has an approximate 11% to 15% share of the total PC marketplace.

"I think it will add a point or two to Apple's overall market share," said John Gorton, an analyst at Van Kasper & Co., a San Francisco-based investment banking firm. "Initially, there will be both cannibalization and growth. There will be people who will buy the clones rather than Apple's Mac, and then there will be people that might not have bought a Mac that will."

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QMS, Inc. has announced the QMS Magicolor LX, a color laser printer.

According to the Mobile, Ala., company, QMS Magicolor LX provides up to 600-by-600 dot/in. resolution and prints 12 page/min. monochrome or 6 page/min. color. The printer features network connectivity, an Energy Saver mode and software upgrade options.

A model with 12M bytes of RAM costs \$4,999, and a 2M-byte model is \$5,699.

► **QMS**

(334) 639-4464

Comprose, Inc. has announced ProcedureWrite, software that walks a user through writing a customized procedure.

According to the St. Louis firm, ProcedureWrite provides a series of detailed pick lists and flexible data-entry fields.

Users can incorporate graphics and illustrations using Microsoft Corp.'s Object Linking and Embedding (OLE).

ProcedureWrite costs \$499.

► **Comprose**

(314) 968-9977

Extensis Corp. has announced PageTools for Windows, a collection of additions for Adobe, Inc.'s PageMaker 5.0.

According to the Portland, Ore., company, PageTools for Windows provides a PageBar tool bar that can be customized.

PageTools for Windows costs \$129.

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Joe Coates, President of Coates & Jarratt, Inc., looks at the future of Information Technology. Coates takes you on a stimulating journey into the near and far future, followed by an invigorating, highly interactive questions and answers session.

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Howard Anderson, Managing Director, The Yankee Group

Panel:

Steve Brooks, Executive Director of IS, Walt Disney Company

Tom Robben, V.P., Application/Strategic Architect, Core Cash & Security Systems, J.P. Morgan

David P. Rodgers, Vice President, Corporate Architecture, Sequent Computer Systems, Inc.

Clifford Rushton, MIS Director, Federal Paper Board, Customer of Progress Software Co.

Client/Server Technology

Leader:

Alan Alper, Editor, *Computerworld*, *Client/Server Journal*

Panel:

Thomas E. Furey, Jr., General Manager, IBM Worldwide Open C/S Strategy and Integration

Tsvi Gal, Senior Vice President, Client/Server Systems, Bank of America

Dale Gentsch, Partner, Price Waterhouse LLP

Robert Yellin, Chief Technology Officer, Legent Corporation

William Zeitz, President, Zeitz & Associates

Mobile/Wireless Computing

Leader:

Andrew M. Seybold, Editor-in-chief, *The Outlook on Mobile & Professional Computing*

Panel:

Enrique Crespo, Manager of Corporate Sales Systems, The Torrington Company

Chuck Parrish, General Manager, Mobile Data, GTE

Mike Radigan, Program Manager, USCO market-to-collections, Xerox Corporation

Sandy Sully, Vice President of MIS, 3Com Corporation

Next Generation Databases

Leader:

Richard Finkelstein, President, Performance Computing

Panel:

Michael Abbey, Database Administrator, Auditor General's Office of Canada

Ronald S. Elkin, Program Manager, Battelle Memorial Institute

David Lambkin, V.P., Information Systems, CNA Insurance Co., Customer of Sybase, Inc.

Britt Mayo, Director, Information Technology, Pennzoil, Customer of Microsoft Corp.

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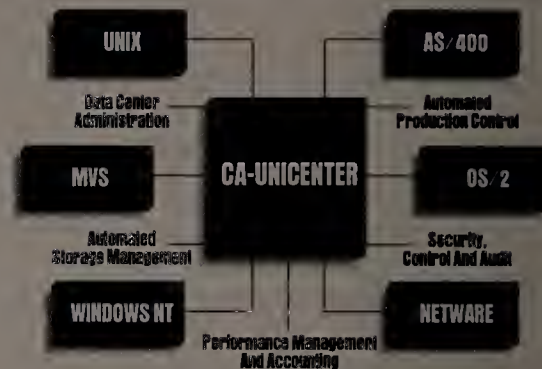
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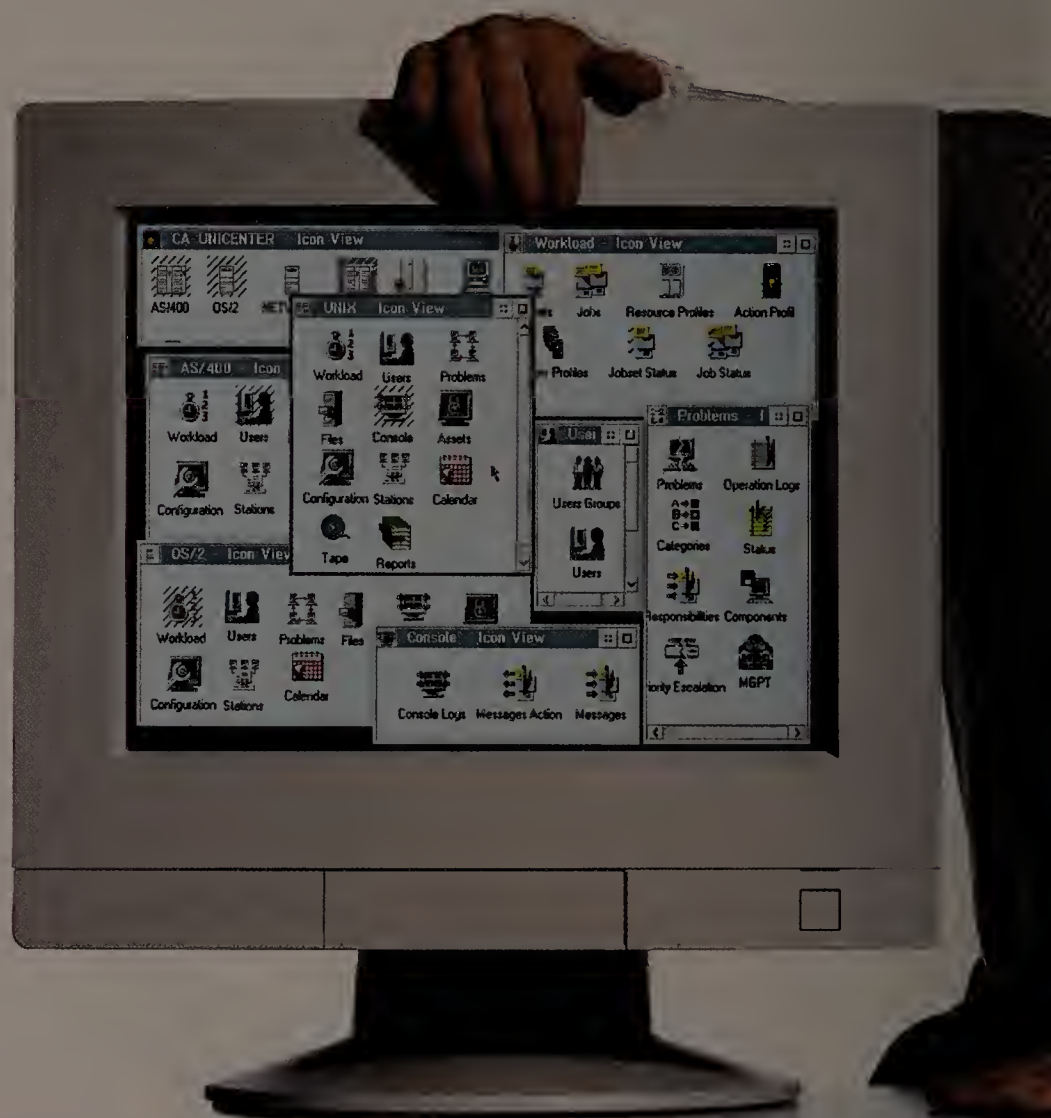


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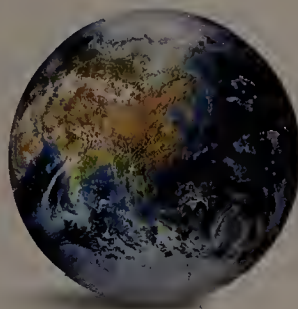


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Finalists

KPMG Peat Marwick's Electronic Performance Support System (EPSS)

"We had nearly 2,000 pages of paper-based training materials that we had developed over the years," notes Ken Smith, senior instructional designer at KPMG Peat Marwick. "It was difficult to maintain and distribute to the field."

Corporate-wide, KPMG Peat Marwick had moved to Microsoft Windows and Windows-based tools, so Smith and his colleagues, including Fred Dunn of Fred Dunn Associates (Oakland, CA), were able to create the Electronic Performance Support System (EPSS) to train incoming entry-level accountants in tax law and accounting procedures. EPSS runs on Windows 3.1 and Windows for Workgroups.

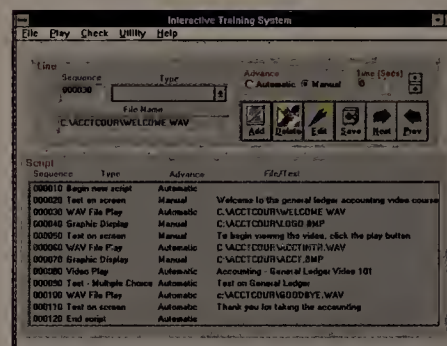
"Although the system was only recently deployed," says Smith, "we've seen a shortened training time and higher retention of lesson material. The faster we are able to effectively train our incoming accountants, the sooner we can assign them to clients. EPSS allows trainees to proceed at their own pace and take advantage of information links embedded in the course material. Users can click on buttons as well as hot spots to navigate."

From Microsoft: Visual Basic, Prof 3.0; Multimedia Viewer 2.0; Access 2.0
From Desaware: Spyworks 2.0
From MicroHelp: VBTools 4.00
From Alex Spektor: MCURSOR.VBX 2.0

Mingione, Borruso & Company's Interactive Training System

With the help of TB Software, this East Haven, CT-based accounting firm developed a training system that enables users to play analog video on their PCs.

The system, says developer Ron Borruso, has enhanced "both personal and professional growth for our employees and clients." The result? Employees as well as clients who use the system acquired both accounting and PC skills faster. "Instead of one Excel expert, we have many," reports Borruso.



The system allowed his company to purchase "canned" video courses and ensure that all employees finish the training course. Employees, meanwhile, can schedule and complete the video training at their own pace. Now they vie for the highest test scores.

From Microsoft: Visual Basic 3.0
From Lenel: Media Developer 2.0
From Sheridan Software: Data Widgets 3.0
From Blue Sky Software: Robo Help 3.0
From Sony Corp.: VISCA Standard 1.0
From Drivers In Motion Technology: Picture Perfect 2.0

Suburban Gastroenterology Associates'

MOMS for Windows

A complete medical office management system for physicians' offices, MOMS consists of four inter-related modules that enable users to access patient, claim, insurance and billing information. MOMS incorporates pop-up windows, dropdown boxes, browser buttons and scroll bars to store practice information.

Because MOMS includes a direct link to insurance carriers, physicians' offices can submit claims electronically without going through a clearinghouse, thus avoiding costly per claim charges.

By billing claims electronically, physicians receive payment within 15 days rather than six weeks or more when claims are handled manually. MOMS not only eliminates most of the paperwork associated with medical offices, it also minimizes rejected claims, thanks to initial system edits, tracking and status updating.

MOMS is easy enough to use that novices are able to submit claims electronically after only a few days using the system. Medical offices report that MOMS results in either personnel reductions or refocus on collections. Some offices report saving over \$200 per month in paper costs.

From Microsoft: FoxPro 2.5, 2.6; FoxPro Help Compiler
From Datastorm: Datastorm Procomm Plus 1.0, 2.0

BANKING/SECURITIES

Finalists

Banco De A. Edwards' Banca Virtual

As the banking market in Chile has become more competitive, Banco De A. Edwards sought ways to lower operational overhead while improving process times. Its solution, developed with Xerox Chile and Santiago-based Open Tek, is Banca Virtual, a new commercial platform from which the bank's executives have been able to satisfy the client.

"Banca Virtual," comments project head Nicolas Roca, "allows our executives to have all client and product information on hand. It has a multi-entry point design that allows any specific function to be reached through product or action grouping."

Roca notes that Banca Virtual, which is used by 120 executives, "allows various simulations of the Bank's products, identifying the best option for the client as well as displaying the other alternatives."

"Banca Virtual has given our bank a competitive edge, allowing us to lower operational overheads and costs while improving process times. Banca Virtual is not simply a software solution but a solution that has involved fundamental changes in the critical business processes of our bank."

From Microsoft: Visual Basic 3.0; Visual C++; SNA Server 2.0; Word 6.0
From Oracle: SCO Oracle 7.0
From Sheridan Software: Data Widgets 1.0
From Software Interphase: Help Magician 2.25
From Xerox: Joiner 3.0

I.W.A. + Community Credit Union's Relationship Banking System (RBS)

A smaller player in a market dominated by very large financial institutions, IWA knew, as IS manager Paul Friesen puts it, "that in order to grow and prosper, we must have access to the data and make changes to products and services as quickly as possible."

So, with help from Prologic Computer Corp., IWA traded in an inflexible, expensive service bureau-based mainframe application environment for RBS, a totally-integrated, retail, online banking system.

The RBS application comprises some 80,000 lines of code — compared to a typical mainframe application that would require one-to-two million lines of code and offer far less functionality.

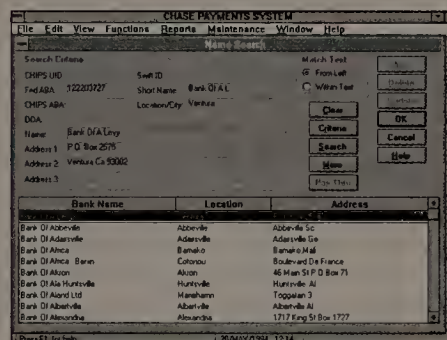
Now, reports Friesen, "IWA has become a clearly defined niche player in its regional financial services market, able to compete effectively across a wide range of products and services."

"Employees have access to more information, allowing them to be more effective in customer service situations. Managers can make more complex queries of the database, allowing better-quality decisions. Customers' accounts are available to them by phone 24 hours a day."

From Microsoft: Visual C++ 2.0; Windows NT 3.5; SQL Server 4.21a; ODBC SQL Driver 2.0
From Prologic Computer Corp.: PROBE for Windows NT

Chase Manhattan Bank's MicroStation for Windows

"Treasury managers of financial institutions and multinational corporations are being asked to assume increased responsibility for global cash management activity at the same time that their staffs are being reduced," reports Michael Mandelbaum, vice president at Chase Manhattan.



MicroStation for Windows enables treasury managers to better utilize their staffs, thanks to a single-window, multibank payment and reporting capability that can directly interface with other back office treasury systems.

Chase customers have saved up to 60% due to processing efficiencies and back office data integration.

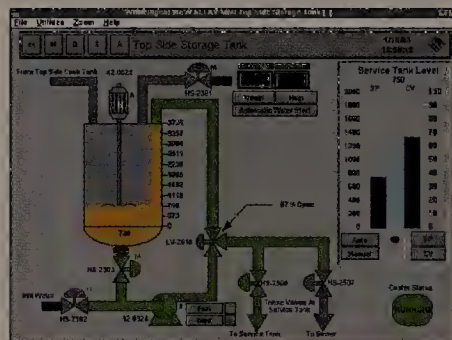
From Microsoft: ODBC SDK 2.0; Windows SDK 3.1; C7/Visual C 1.51; Visual Basic 2.0
From Gupta Technologies: Gupta and Gupta NLM 5.2.4
From Blue Sky Software: Robo Help 2.6.1
From FarPoint Technologies: FarPoint Professional Toolkit 3.0
From Wall Data: Rumba Client 1.0
 ... and others

ENVIRONMENTAL/NATURAL RESOURCES

Finalists

Blandin Paper Company's Coating Clay Prep Area Automation

"Our customers were demanding increased quality, which we could not track or control," comments Dave Ferguson, process control technician at Blandin Paper. The company operated five different control systems in five different areas of its paper mill, causing high maintenance and training costs and serious quality problems.



The firm's new Coating Clay Prep Area Automation system, designed entirely by maintenance and operations personnel with help from Rockwell Software and Allen-Bradley, has changed all that.

"Our quality and consistency of product are way up," says Ferguson. "We now have much smoother operations with a large decrease in downtime. And maintaining the system is now much easier."

From Microsoft: Office 4.3
From ICOM (Rockwell Software): Win View 3.10; Win Logic 5 2.07.03; Win Lin X 4.37.01; Win Trend 2.07; Win Quality 1.34.00; Win View Runtime 3.10; Emulate 5 1.21.00

Amoco Production Company's Projects Evaluation Tool Set (PETS)

When Amoco's construction department realized its future depended on "its collective ability to quickly and effectively assess and exploit business opportunities," the firm began work on PETS, a networked client/server-oriented decision support system that links inhouse and third-party applications with a database and an expert system.

The business goal of PETS was to quickly and effectively evaluate opportunities and to stimulate more creativity and imagination in business deals. PETS was developed to help project evaluators quickly assess the factors and circumstances that have the largest impact on 'the business deal.' PETS accelerates and enhances the overall analysis and evaluation process by automating routine number crunching and business graphic and report generation.

Team leader Michael Ruggiero reports that PETS has reduced time spent on gathering cost data, generating cost estimates and documenting results by an estimated 60%.

From Microsoft: Windows NT Workstation 3.5; Windows NT Server 3.5; SQL Server 4.21a; Visual C++ 2.0; Win32 SDK et al on MSDN CD-ROM 12/94; Visual Basic Professional 3.0; FORTRAN Powerstation for NT 1.0a; MS Test 3.0
From MapInfo Corp.: MapInfo 3.0; MapBasic 3.0
From Shapeware Corp.: Visio & VDK 3.0
From Palsade Corp.: @RISK 3.1; @RISK for Project 1.12a; RISKview Pro 1.0
... and others

Chevron USA's Land Information System (LIS)

Inaccurate and manually-intensive information and out-of-date work processes were affecting Chevron's costs and its ability to react quickly to changing business conditions.

The solution is Chevron land department's LIS, an enterprise-wide land, lease and contract management system which fully integrates digitally-captured land map data, textual information, scanned images and documents into a simple modular interface.

Data (geopolitical, organizational and cross-reference) that was once managed manually is now automatically created by the system. Integrated scanning and e-mail has eliminated previous copying and mailing requirements.

Now processes that used to take 75+ days and 16 people are completed in hours with three people or less.

From Microsoft: Visual C 1.5; Word 6.0; Mail 3.2; Excel 5.0; Powerpoint 4.0
From AutoDesk: AutoCAD 12c4 windows; AutoCAD Data Extension (ADE) 1 c1
From Geo/SQL Corp.: Spatial Analyst 2.1
From Powersoft: PowerBuilder 3.0a; PowerViewer
From Software Integration: Visual Developer Kit 1.6
Oracle Corp.: Oracle RDBMS & Tools 7
From Blue Sky Software: Robo Help 2.61
From Pioneer Software: Q+E Database Editor 5.03
From Caere Software: OmniPage Professional 2.11
From Accusoft Corp.: Accusoft Image Format Library 4.0

FRANCHISE

Finalists

Power House Gym's Gym's Gold

Gold's Gym franchises needed to automate to improve profitability, so Caracas, Venezuela-based J.L. Sistemas, a Microsoft Solution Provider, took on the task and created Gym's Gold.

Designed to help manage the franchises, Gym's Gold handles registration, invoicing, payroll, point-of-sale and reporting. Gym's Gold uses a camera to photograph members, storing the photos in a database and generating member ID cards. The system also includes an electronic cash drawer and an interface for controlling electrical doors.

Gym's Gold boasts a friendly user interface that makes training easy. Franchise profitability has climbed thanks to:

- The system's tracking of cash receipts;
- Improvements in cash flow thanks to better tracking of revenues, members, instructors and costs; and
- Reductions in paperwork and access to more accurate information.

Automation of processes brought order to the organization, freeing managers of paperwork so they could concentrate on marketing.

From Microsoft: Visual Basic for Windows 3.0; Help Compiler 1.0; Word for Windows 2.0

From Creative Labs: Video Blaster Developer Kit

From APEX Software: TrueGrid Pro

From Crescent Software: QuickPak Professional 3.2

Molly Maid's Molly Maid Information System

"Many franchising organizations become too large and impersonal and lose touch with their franchises," explains Ted Kennedy, vice president of franchise support at Molly Maid, Inc. "This can quickly lead to the demise of a company, as it did to Molly Maid in 1989."



The Molly Maid Information System, developed with the help of Servant Systems, Inc. in less than two man-months, has been, according to Kennedy, "a key component in the turnaround of our company."

Thanks to the system, Molly Maid now has 21 employees rather than 50, but maintains closer contact with franchises and is much better able to serve them.

"Information flows extremely quickly within the organization, and our franchises experience much more consistent support from our national office," Kennedy reports. "We also understand our business much better."

From Microsoft: Access 2.0; Word 6.0; Excel 5.0; Mail, Mail Remote 3.2

From WexTech Systems: Doc-to-Help

Butler Manufacturing Company's The Butler Advantage

"The systems building industry is highly competitive," comments Jim Juliff, computer services manager at Butler Manufacturing. "Differences in speed and service are critical to maintaining and increasing market share."

The Butler Advantage, running on a variety of PC and network platforms, provides Butler builders with an easy-to-use, quick-response sales tool for configuring, designing and pricing building solutions.

The Butler Advantage provides Butler builders with a distinct marketing advantage and boosts builder office productivity significantly.

"Butler builders have been able to leap past their competitors," Juliff notes, "and provide unexpected levels of speed and service to their customers."

From Microsoft: Office Pro 4.3; Visual C++ 2.0; FORTRAN 5.1; Microsoft Development Platform

From Borland: Borland C++ 3.1

From Micro System Options: 3d Graphic Tools 3.0

From Fair Com: c-tree Plus 6.0

From Nu-Mega: Bounds Checker 2.2

From SLR Systems: Optlink 5.1

From Intersolv: PVCS Version Manager 5.1.1

From AutoDesk: AutoCAD 12 for Windows

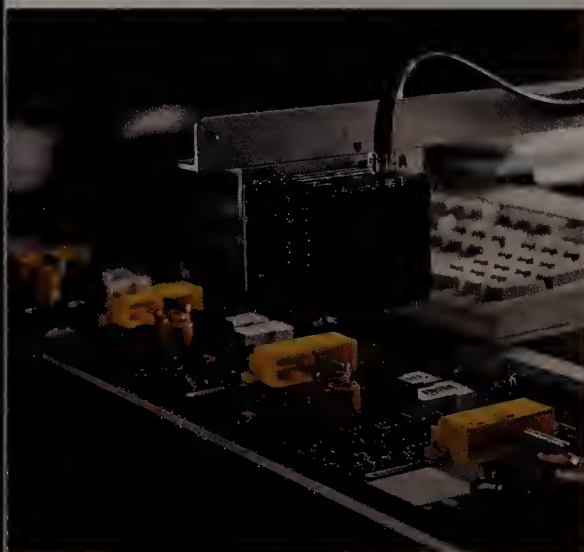
From Blue Sky Software: Robo Help 2.61

From Asymetrix: Toolbook 1.53

From Popkin Software & Systems: System Architect 3.0

From PKWARE: PKWARE Compression Library

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MIND

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Microsoft® products, including Microsoft Windows NT™ Server, part of the BackOffice family. With the new system, circuit board verification time has decreased from 30 seconds to just two. This allows verifications to be performed automatically at multiple points along the production line, instead of only at the end. So rework is minimized.

🚗 "With this cost-effective solution, we've gotten a tremendous boost in production capacity," explains Steve Deremer, senior systems analyst at NEC America, "while maintaining the same level of quality." 🚗 The system, based on Windows NT and SQL Server™, has proven extremely easy to install and administer. It's also easy to access. A user-friendly reporting front end, created with Microsoft Visual Basic® and Microsoft Access, allows users to generate their own reports in minutes. So IS people have more time to do their own jobs. Like creating new applications. 🚗 To get more information on how Microsoft can help you gain

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Finalists

U.S. Postal Service's Network Operations Management Service (NOMS)

Since colonial times, the Postal Service has, observes Robert Earlewine, USPS' manager of transportation system operations, "relied on after-the-fact contingency planning."

But in order to stay competitive, the USPS is anticipating problems and bottlenecks with its Network Operations Management Service (NOMS).

NOMS provides Postal Service managers with "one-stop" access to virtually all the information needed to deliver the mail. USPS crisis managers are now anticipating problems before they become critical. Early detection and resolution of problems can result in substantial savings while improving performance.

For the first time, with NOMS, the USPS can make a contingency decision, such as whether to roll out another 747 jet, based on accurate information about mail volume, facilities, weather conditions and equipment availability.

Part "eye in the sky," part decision support system, part communications hub, NOMS helped the USPS make the 1994 Christmas season its most successful ever.

From Microsoft: Visual C++ 1.5, 2.0; Visual Basic (ED); Win32 SDK; SQL Server for Windows NT; Windows NT Server 3.5; Windows for Workgroups 3.11; Access 2.0; Excel 5.0

From Blue Sky Software: Robo Help

From MapInfo Corp.: MapInfo

Others: ODBC Drivers; Outside In for Windows; cc:Mail; Dialogic drivers & libraries

San Bernardino County's Construction Project Management Information System (CPMIS)

When San Bernardino County undertook a \$463 million construction project, it was clear that only automation would keep the effort from being deluged in paperwork.

"Without the Construction Project Management Information System," reports Evane Foster, program manager, "the project would generate five million documents." The county feared not only productivity losses and rising costs but also legal claims for compensation.

Instead, the multimedia CPMIS integrates a 9,000-activity construction schedule, change order control, document management, workflow, office automation, labor tracking, field inspections and cost planning and control.

All types of construction documents are transmitted electronically, enabling the sharing of common data and speeding up management processes. Foster notes that the CPMIS encourages the project's 80 different contractors "to work in harmony to achieve a common objective. Sharing common data, access to a single electronic copy of contract document, monitoring response times and speeding up management processes encourages partnering."

From Microsoft: Visual Basic; Windows 3.11; Windows for Workgroups 3.11

From Borland: Paradox 1.0, 4.5

From Oracle: Oracle RDBMS 7.015

From Powersoft: PowerBuilder

... and others

New York Midtown Community Court's Midtown Community Court System

"To improve the quality of justice," points out John Feinblatt, Community Court coordinator, "court decision makers in high-volume courts need detailed, case-specific information immediately."



In one New York courtroom, they get it. The Midtown Community Court System enables judges to review, on a single screen, arrest, complaint and criminal history information as well as sentence recommendations and defendants' problems. Flashing buttons alert court officials to prior court appearances and past sentence compliance. Prominently displayed large-screen TVs provide public information about all cases.

The system has helped the court increase constructive sentences and reduce case processing time. Now justice is speedy and effective.

From Microsoft/Borland: C++ 3.0

From Powersoft: PowerBuilder 2.0, 3.0, 3.0a, 4.0

From Sybase: Sybase 4.92

From Digital Equipment Corp.: RDB 4.2

From AST: PenRite Pro 1.0

From Laservlew: Laservlew Windows 2.12

HEALTHCARE

Finalists

Strang Cancer Prevention Center's Strang FHx Engine and Database

"This year, at least 190,000 women will be diagnosed with breast cancer," notes Charles Potter, director of medical informatics at Cornell University's Strang Cancer Prevention Center. And this year, 45,000 will die from the disease, which involves both environmental and biological factors.

Strang's Family History (FHx) Engine and Database tracks the family histories of 180,000 relatives of 16,000 women who are at high risk of developing breast cancer. The system updates family histories annually, accepting input from fax/scanners, "kiosk" PCs installed in remote medical offices and traditional data entry.

The system has enabled the creation of a very large research database that will remain consistent for long-term research. Open access to data and data export capabilities are available to researchers and clinicians.

The discovery, in August 1994, of the first gene mutation linked to breast cancer (BRCA1) has prompted great excitement at Strang, and Strang FHx families are participating in the first clinical testing of the gene.

From Microsoft: Visual Basic 3.0; Visual C/C++ 2.0; SQL Server 4.2; Windows NT AS 3.5; Windows Help Compiler 3.1/Word

From Logic Works: Erwin 2.0

From Cardliff Software: Teleform Designer 3.0

From Intersoft: QELink 2.12

St. Alphonsus Regional Medical Center's Hlnet Healthcare Information System

"Healthcare," observes Debra Harris, director of medical information systems at St. Alphonsus Regional Medical Center in Boise, ID, "is the most information-hungry and information-bound business in the U.S."

To ease the threat to quality of care and cost containment posed by paperwork and manual processes, St. Al's has built a comprehensive system that:

- Connects a wide variety of patient data, including scanned historical records, electronic data, images and voice records;
- Analyzes that data using artificial intelligence techniques to help improve quality of care and patient outcomes; and
- Delivers information across a campus-wide fiberoptic network with dialup links.

The system links legacy systems and can run on portable computers for bedside use and home health.

"Now," Harris reports, "many physicians are anxious to have online access and they ask, 'When can I get this in my office?' And management sees that new Windows-based solutions take much less time to install, and cost much less to boot."

From Microsoft: C++ 2.0; Visual Basic 3.0; Excel 5.0; Project 4.0; Access 2.0

From Netsoft: NS/Midrange Bundle 4.x

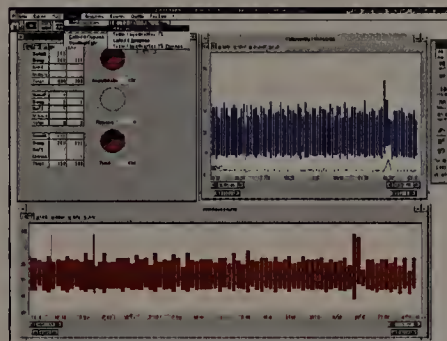
From Novell/WordPerfect: WordPerfect for Windows 6.x

From Aldus: Pagemaker 5.0

From DCA: Remote LAN Node 1.x

Columbia Presbyterian Medical Center's Picis

A clinical information system that manages patient data in critical care environments, New York City-based Columbia Presbyterian Medical Center's Picis is designed to operate on all standard networks and to integrate into existing medical situations and clinical practices.



Information technology has been a long time coming to acute care environments, due chiefly to the informational complexity of acute care itself as well as difficulties inherent in integrating the communications protocols of varieties of medical equipment and the high cost of systems.

PC-based Picis connects to medical devices such as monitors and ventilators, displaying collected data along with manually entered data in a GUI format. Patient care is enhanced, medical personnel can immediately access critical patient trending information as well as lab results. Picis also collects vital cost data.

From Microsoft: Visual Basic; Visual C++
... and others

MANUFACTURING

Finalists

Sterling Winthrop's Integrated Multimedia Security System

"We needed to provide uninhibited access to our employees while providing a safe and secured working environment for them," explains Dan Keane, manager of safety & security at Sterling Winthrop. "Being located in a large midtown Manhattan high-rise with many tenants posed a huge problem for our security personnel."

Solution: the four-module Integrated Multimedia Security System. A corporate badging module stores employee data, including photo, signature and voice sample. It also generates secure badges that are directly linked to an access control and monitoring module linked to a closed circuit TV system that automatically videotapes in response to alarms. An asset management module tracks company assets.

"We've been able to access needed information on demand," says Keane, "and save money by removing our time lapsed recorders."

These days, corporate theft is down by 80%, and Sterling Winthrop's security force is smaller.

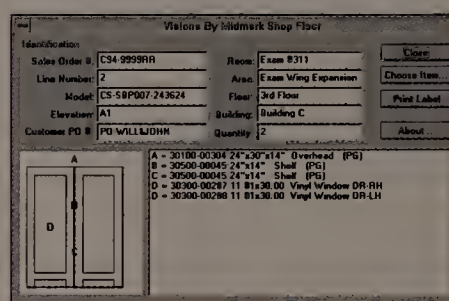
"In the first year of operation," says Keane, "the system has completely paid for itself."

From Microsoft: Visual C++ 2.0; Visual Basic 3.0; SQL Server 4.21

From Lenel Systems: MediaDeveloper 2.1; MediaRecorder Toolkit 1.1; Lenel Gallery 1.1

Midmark Corp.'s Shop Floor Interface

"Midmark invented three new lines of medical cabinets for the healthcare industry," comments Chris Neff, Midmark customer service manager. "The problem was that any one of the lines could generate over three million possible configurations. We had a revolutionary product with no feasible way to manage the combinations."



Midmark's Shop Floor Interface solution generates a complete assembly print and Bills of Material for the new products directly from data embedded in the original order created by Midmark's Create-A-Cabinet software, where the customer defines a configured cabinet.

"We've made it to market in record time with the only fully automated configurable cabinet product in the healthcare industry," Neff says. "We've saved many man-years of work while still making use of our existing systems."

From Microsoft: Visual C++ Pro 1.5; Access 2.0; SQL Server 4.21; Windows for Workgroups 3.11; Excel 5.0; NT Server 3.5

From Crystal Computer Services: Crystal Reports 3.0

Rockwell Avionics' Compass Manufacturing Engineering System

"The complexity and cost of new product introductions is increasing rapidly," reports Eric Stern, manufacturing engineering manager at Rockwell's Collins General Aviation Division. "In a flat market with stiff competition, we're required to bring new products to market quickly."

Rockwell's Compass Manufacturing Engineering System incorporates all the technical knowledge, including graphical information, about how products are built and produces manufacturing work instructions for use in the factory.

Replacing a mainframe forebear and much manual labor, Compass has speeded product introductions and enabled comparisons and analysis of different product revisions.

"Compass has been a catalyst," says Stern. "Its success has given credibility to the use of windows and client/server technology to tackle tough issues."

From Microsoft: Word for Windows 6.0a

From Gupta: SQLWindows 5.0.0

From Sybase: SQLServer System 10 10.0.2

From Blue Sky Software: Robo Help 2.61

From Embarcadero Technologies: RapidSQL 1.18; DBArtisan 1.03b

From Osoft Development Corp.: SpinList 2.1.1a

From HPI: Installt for Windows 5.0

From Deneba Software: Canvas 3.5.2

From BeyondMail: BeyondMail for Windows 2.0

From Ayers/Stedman: IconMagic 1.00

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SERVICES

Finalists

Federal Express' FedEx Ship™

"For years, Federal Express has successfully automated its large accounts, affecting about 60% of our shipping volume," notes Robert Hamilton, manager of FedEx's information services marketing. "With FedEx Ship, we aim to deliver similar automation to the small-volume, infrequent shipper."

FedEx Ship provides complete shipping and tracking services to smaller shippers with functionality that's divided into six areas: ship, track, log, address book, settings and online help.

"We are very early in the roll out of FedEx Ship, but the results, so far, are positive. The customers love the product, we are seeing some increase in shipping volume, and our personnel find the automated labels easier," says Hamilton.

From Microsoft: Visual C++ 1.5; Visual C++ Cross-Development Edition for the Mac 2.1; nMake 1.40; Access 2.0; Excel (Mac) 5.0; Project (Mac & Windows) 3.0; Word 5.1a (Mac), 6.0 (Windows)

From Borland: Brief 3.1

From Premla: Codewriter 3.1

From Falcom: CTree 6.0

From Frame: FrameMaker 4.0

From Virtual Media: HDK 2.5

From Apple Computer: MPW 3.3

From Adobe: PhotoShop 2.5

From Polytron: PVCS 1.4a

From Quark: QuarkXPress 3.3

Wheaton World-Wide Moving's Wheaton Clipper

"The growth of the household moving industry has been stagnant for the last ten years," explains Gary Schuman, vice president of information systems at Wheaton World-Wide Moving. "The major potential for the growth of our company is through adding local companies to our group of affiliated agents."

In an industry that remains largely reliant on manual traffic planning systems, Wheaton's Clipper offers an edge. Clipper facilitates sophisticated trip planning and dispatch functions. Shippers' orders are tracked from entry through delivery, which has reduced planning time and improved customer service.

"We've made a significant beginning at becoming a technology leader in our industry," says Schuman.

The benefits of the system include on-time, profitable deliveries, reduction in load-planning time, and an increase in customer satisfaction.

From Microsoft: Visual Basic 3.0; SQL Server 4.21a

From Crescent Software: QuickPak Professional 3.0

From MicroHelp: 3-D Gizmos 2.0

From SpyWorks: VbxRef 2.1

From Desaware: DbcSubclassing Control 2.0

From FarPoint Technologies: SpreadVBX 2.1

From Sheridan Software Systems: 3-D Widgets/1 3.0a; 3-D Widgets/2 1.0r

From Apex Software Corp.: TrueGrid Bound Database Grower "Gunsmoke"

The Associates' PowerVision

"As a service provider in a low-margin industry," observes Guy Ser-eff, lead programmer/analyst at The Associates, an automotive fleet leasing firm, "it's important for the business to react in a timely manner."



PowerVision is the company's new architecture, designed to migrate its 10-year-old, mainframe-based system into a flexible, client/server, GUI-based environment.

PowerVision's first two subapplications involve License and Title and Documentation.

PowerVision uses workflow management to assign tasks directly to employees and has enabled The Associates to reduce its headcount.

From Powersoft: PowerBuilder 3.0a; PowerViewer 3.0

From Wang: Open/Image Objects for PowerBuilder 1.0

From Wall Data: Rumba Tools for PowerBuilder 1.0

From Watcom: Watcom SQL Network Server for NetWare 3.2c

From Sybase: SQL Server 10.0.2

From Software Interphase: Help Magician 2.0

WHOLESALE/RETAIL/DISTRIBUTION

Finalists

Metro Tool & Equipment Company's The Cutting Edge™

"In order to grow our business, we needed to differentiate our company as a leader in customer service," says Jim Noble, president of Detroit-based Metro Tool & Equipment.

Metro's answer was The Cutting Edge, an interactive CD-ROM catalog that gives customers around-the-clock access to Metro's industrial products and services. The disk consolidates all files, sizing charts, price lists and other information needed for ordering industrial tools. With one click, customers find an interactive overview of Metro's facilities, company contacts, a computer help line, and directions to its store.

The Cutting Edge has increased transaction time efficiency by 75%. Sales staff now dedicates more energy to cultivating new accounts, per salesman revenue is up, and so is repeat business.

"Designed in the graphically intuitive Windows environment, The Cutting Edge is a simple, convenient and efficient way for even inexperienced computer users to communicate with us," adds Noble.

From Microsoft: Visual Basic 3.0; Access 2.0
From Sheridan Software Systems: Designer Widgets 1.0b
From Crescent Software: QuickPak Professional 3.1; PDQComm 2.1
From Crystal Computer Services: Crystal Reports 4.0
From Apex Software Corp.: TrueGrid 2.1a

Midmark Corp.'s Create-A-Cabinet™

With a leading-edge product, medical cabinet maker Midmark Corp. needed leading-edge software to be able to sell it.

Create-A-Cabinet allows customers to combine components from Midmark's new line of cabinets into custom-configured products via its simple graphical interface.

Create-A-Cabinet offers over three million possible cabinet variations from which to choose. It then stores the custom cabinet as an orderable end item with all the internal manufacturing data required on the shop floor for production. All this is accomplished in the background while Create-A-Cabinet builds a custom product which can be directly exported into Midmark's order entry and MRP systems.

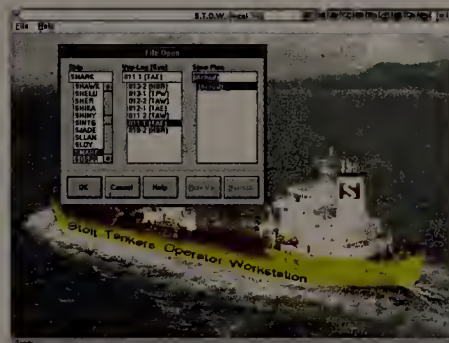
"Our users and dealers are very pleased with Create-A-Cabinet and their ability to design custom cabinets," reports Chris Neff, customer service manager at Midmark.

"We made it to market in record time with the only fully automated configurable cabinet product in the healthcare industry," he says. "We saved man-years of work."

From Microsoft: Visual C++ Pro 1.5; Access 2.0; SQL Server 4.21; Windows for Workgroups 3.11; Excel 5.0; NT Server 3.5
From Crystal Computer Services: Crystal Reports 3.0

Stolt Parcel Tankers' STOW

"Customer sensitivity to cargo contamination has increased significantly in the last two years," notes Kenneth Bloom, business systems manager at Stolt Parcel Tankers. That's why every assignment of cargo to a tank in one of Stolt's 65 ships must satisfy thousands of rules.



STOW is the solution. The system checks over 3,000 rules to verify that its plan meets customer requirements and all the rules of safe cargo carriage. Stolt is now saving \$3 million a year from decreased contaminations.

From Microsoft: Word for Windows 2.0
From Borland: Borland C++ 3.0, 3.1, 4.0, 4.5; Object Windows Library 1.0, 2.0, 2.5; dBASE 4.0
From IBM Corp.: RPG/400, DDS, CL 2.1, 2.2, 2.3, 3.1
From Sequiter Software: CodeBase 4.5
From Crystal Computer Services: Crystal Reports 2.0, 4.0
From Protoview Development Corp.: DataTable 1.1
From Nu-Mega Technologies: Bounds Checker 1.1, 2.0
From WexTech Systems: Doc-to-Help 1.1
From Intersolv: Q&E Database Editor 5.0
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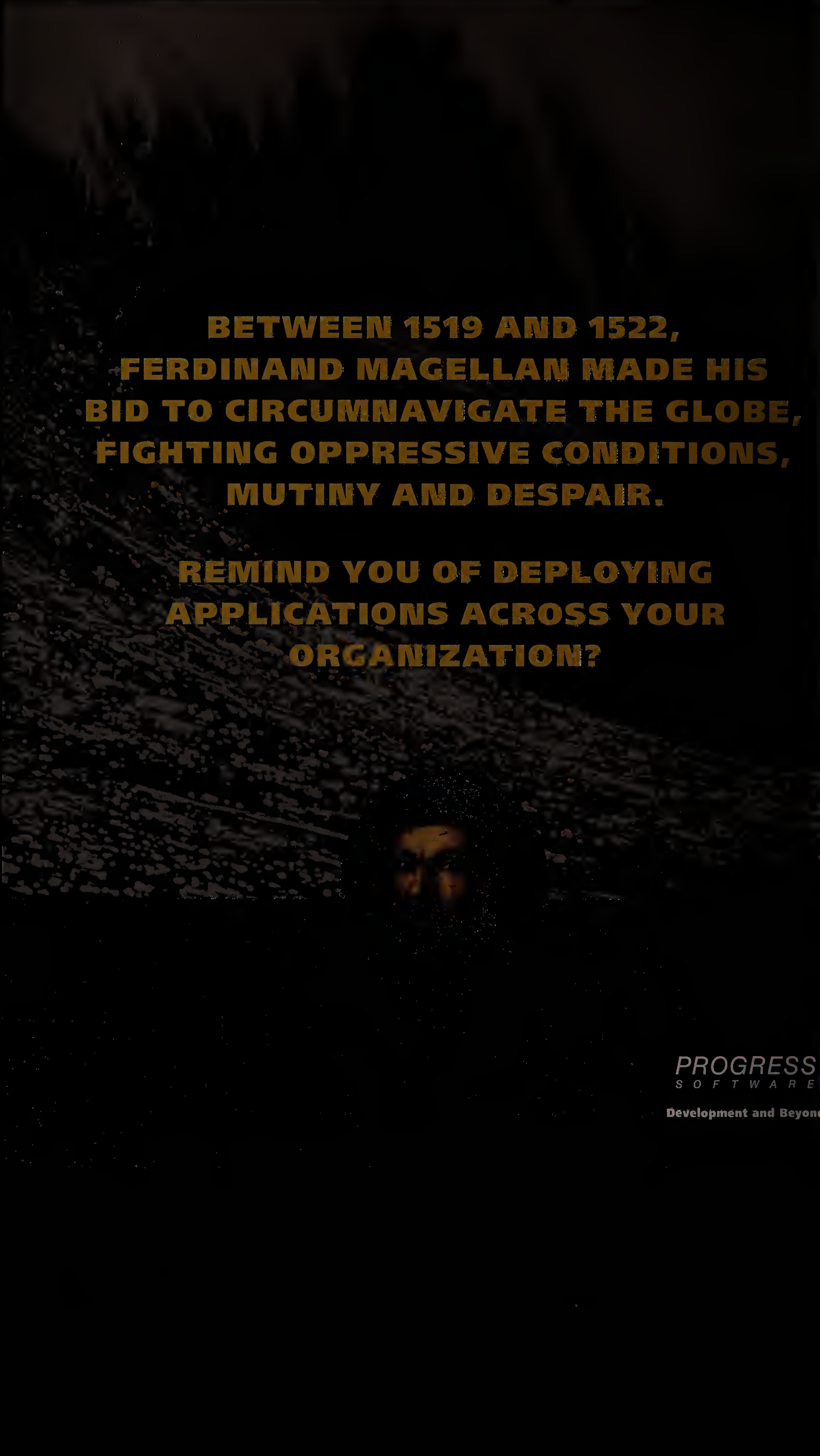
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PROGRESS
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Development and Beyond

Power Mac

CONTINUED FROM PAGE 39

as well as a copy of Windows 3.11.

We will discuss the Macintosh side first because the unit starts on the Macintosh desktop when booted. The Power Macintosh 6100 is a rocket, a blazing comet of pure computing for any routine Macintosh business application. Testing with Claris Corp.'s Impact, Aldus Corp.'s PageMaker and Microsoft Corp.'s Word 4.0 and Excel 3.0 showed perceived performance as stunningly more responsive than with non-PowerPC Macintoshes and markedly faster than these programs' analogs running on a 486DX/66 with Windows.

The only area where we found merely mortal performance was in running motion video under Apple QuickTime drivers. The results were acceptable but left room for significant improvement.

Making this machine work in a DOS/Windows environment requires using the preinstalled system software that allows you to switch between operating systems by pressing Command-Shift. The screen fades out and back as you toggle between environments. You dedicate some system memory to the DOS/Windows session — unless you have installed a SIMM on the 486 card — and build a DOS partition on your hard disk.

On the tricky side

If you follow the documentation, this is an easy process. Some of the more subtle things, however, aren't so clear from the documentation, such as making sound work from the Windows side. Apple's toll-free technical support will come in handy for some of the subtler parts of getting the machine up and running.

We tested Windows applications along with Windows itself, and they performed without a hitch. Performance was in line with 486DX/66 speeds. Apple claims that providing RAM on the DOS compatibility board dedicated to the 486 processor will accelerate performance.

We challenged the DOS environment with tricky programs, and it responded well to them all. These were push-the-envelope programs that can be ill-behaved, especially on a system that isn't "by the book." Tested applications included Borland International, Inc.'s Reflex 1.0 and Xyquest, Inc.'s XyWrite III.

The DOS/Windows environment was also a mediocre motion video performer with programs that use QuickTime for Windows and Video for Windows. This weighs against positioning the 6100 DOS Compatible as a universal multimedia workstation.

Because the computer has two CPUs, it can multiprocess. This means you can set a long task in motion in one operating system, switch to the other to do other work and have virtually full performance in your current operating system no matter how processing-intensive the task on the other system is.

For anyone who is used to inconsistent response from a Windows application

when a big print job or large draw program rendering is going on in the background, this response is a very pleasant discovery.

There seem to be no technical barriers for using this product for general business Macintosh/DOS/Windows applications. The challenges are all based on the breadth of the user's knowledge.

While the Macintosh is a wonderfully easy environment to learn, the feature-packing of items such as System 7.5

takes a certain toll. And no matter how useful Windows is, anyone who believes it is an easy environment to train newcomers in had better take the nitrous oxide mask away from his face, breathe some real air for a bit, and try training some mortal end users to use it. Both environments have become complex enough that training will be an issue for most end users.

Not everyone will fall short. Intermediate users on both platforms, although

there are few of them, will be comfortable and impressed by the technology.

People who must act as gaskets between departments using different operating systems, as well as those who normally "live" in one operating system and must occasionally use the other, will find this a brilliant, efficient, space-saving solution.

Angus is a project director at The Data Works Ltd. in Seattle

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Source: Survey of **COMPUTERWORLD CD** subscribers, May 1993.

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Systems management tools frustrate users

Lack of standards for desktop products turns users to homegrown solutions

By Steve Moore

Large users are increasingly taking matters into their own hands by stitching together suites of currently available system management tools.

United Parcel Service, Inc., for example, has spent most of the past year putting its desktop management suite together. To administer its large network of Intel Corp.-based PCs and Novell, Inc. NetWare servers, UPS currently uses the Novell Management System, Intel's LANDesk Manager and Compaq Computer Corp.'s Insight Manager, according to Mark Dodge, telecommunications systems manager at the company's Mahwah, N.J., facility.

UPS integrated those three tools with trouble-ticketing software from Software Artistry, Inc. in Indianapolis, "so that alerts from all three tools automatically generate trouble tickets and get to our help desk," Dodge explained.

UPS and other users are frustrated by a bonanza of proprietary desktop systems management products and by vendors' failure to quickly implement standards to enable those products to

work well with one another.

The standard most immediately on the horizon is the Desktop Management Interface (DMI), which was developed by the Desktop Management Task Force (DMTF). The DMI is intended to allow any LAN-attached PC to supply information about its hardware and software to network and systems management applications.

But with some DMI components only recently completed and others still in the works, many users say they cannot wait for a critical mass of vendors to fully implement the standard.

Don't hold your breath

Desktop systems management is well worth addressing, whatever the costs, some said. For every 1,000 PCs that are not correctly managed during their lifetimes, user companies pay out \$1 million to \$2 million for time wasted by systems administrators, among other things, according to research by the Personal Computer Asset Management Institute in Rochester, N.Y.

Therefore, until standards ease the desktop systems management problem,

large enterprises are well-advised to address it head-on by "investing a couple of million dollars and getting minimally a 10-times return on their investments," said Greg Lewis, institute president.

"The DMI is something everyone should keep pushing for, but users shouldn't hold their breath waiting for it to come and save them," he added.

No easy task

But as some users have found out, rolling one's own desktop management tools is no picnic.

"We started really early in client/server and wrote our own [system] configuration, installation and software distribution support systems," said Deems Davis, vice president of information systems at Fireman's Fund Insurance Co. in Novato, Calif.

While the homegrown tools have en-

abled Fireman's to significantly reduce its costs in managing more than 8,000 PCs from a central location, those costs would shrink further if vendors delivered economical, standards-based tools, Davis noted.

"I've got probably five people who maintain and enhance our tool set on a full-time basis, and if there were tools I could purchase for less, then those five people could be writing apps or doing something else to add value," he said.

"The DMTF has moved slowly, and we're glad we haven't waited for" the DMI, Dodge said. On the other hand, though, he does expect DMI to become important once it is broadly implemented.

In fact, Dodge said he tends toward software "from vendors that are making a good-faith effort toward developing products based on DMI."

A sampling of desktop management technologies

Plug and Play/Registry

Developed by Microsoft
Oriented toward Windows-based PCs

Intelligent Manageability

Developed by Compaq
Oriented toward Compaq PCs

LANauditor

Developed by Horizons Technology
(licensed by NetLabs, Hewlett-Packard and Digital)
Supports multivendor PCs with or without agents

PC server market

AST remains in desktop game with overhauled server line, price cuts

By Jaikumar Vijayan

AST Research, Inc., a onetime desktop heavyweight, is struggling to make a comeback in the PC server market.

The Irvine, Calif., company recently announced it will preload Novell, Inc.'s NetWare 4.1 on some models of its Manhattan server line. The company also rolled back prices 13% to 22% on several Manhattan models and announced new uninterruptible power supply and high-speed Ethernet card options across the server line.

Integrated approach

"The announcement definitely keeps AST in the game. I think it's a matter of them finally realizing that they need bundled solutions to compete" in the PC server market, said James Greene, an analyst at Summit Strategies in Boston. Companies such as Compaq Computer Corp. and Dell Computer Corp. have offered these kinds of integrated approaches for some time now, he added.

The server announcement comes after a less than

stellar 1994 for the company. During that year, AST seriously delayed or missed product announcements and laid off around 500 employees by shuttering one of its manufacturing facilities. All this contributed to near stagnant growth in the U.S. [CW, Nov. 28, 1994]. According to 1994 market figures from International Data Corp., AST grew an estimated 1.8% in the U.S. market last year.

AST's NetWare bundle will include software for network and power management as well as virus protection features. According to AST, the bundled NetWare will ease installation problems for network administrators and ease migration hassles when moving from NetWare 3.x to 4.1.

While the added functionality is welcome, it may have come a bit too late for AST from a competitive stand-

point, said one user at a large financial services group, who wished to remain anonymous.

"AST did not have what we were looking for when we needed it, so we tested what was in the market," the user said. The organization, which claims to be a large AST site, is considering migrating to NetWare 4.1 and

recently standardized on PC servers from another vendor.

AST last week also said it is shipping the new Manhattan HighRise rack-mount servers and its Percepta Remote server management add-in boards with predictive failure analysis capabilities.

As major vendors such as Compaq, IBM, Dell and now AST begin to bundle network management and installation software as well as diagnostics capabilities into their hardware, users are getting higher levels of bundled technical implementation support, analysts noted.

"What we are seeing is a gradual diminishment of installation support requirements" in the low and mid-range PC server markets, said John Daly, an analyst at Summit.

Preloaded and bundled

AST's server models that will come bundled with NetWare include the Manhattan V5090/Model 1003E file and application server and the P5090/Model 1003E server. Both come with 16M bytes of RAM, 1G-byte "fast" SCSI-2 hard drives, NetWare 4.1 licensed for 25 users and the Percepta Server Manager.

The server also comes preloaded with software that allows Percepta Server Manager to run on a dial-up line direct to the server from a remote site. This enables remote log-in and diagnostics capabilities. Prices start at \$6,615 for the bundled servers.

AST also cut prices on several Manhattan models. The Manhattan P5090, a 90-MHz Pentium-based mid-range PC server with dual-processing capabilities, will now start at \$4,620, down 13% from the previous starting price of \$5,316.

Similarly, AST's Manhattan G560 minitower server, which used to sell for \$2,880, has dropped 19% to \$2,340. The new prices are effective immediately.

AST's Manhattan P5090 has the following features:

- Dual-Pentium processing capability
- Peripheral Component Interconnect bus
- Error checking and correcting memory
- SCSI backplane with hot-swappable hard drives
- PCI disk-array subsystems, built-in temperature and voltage sensing
- Price: \$4,620 to \$8,485

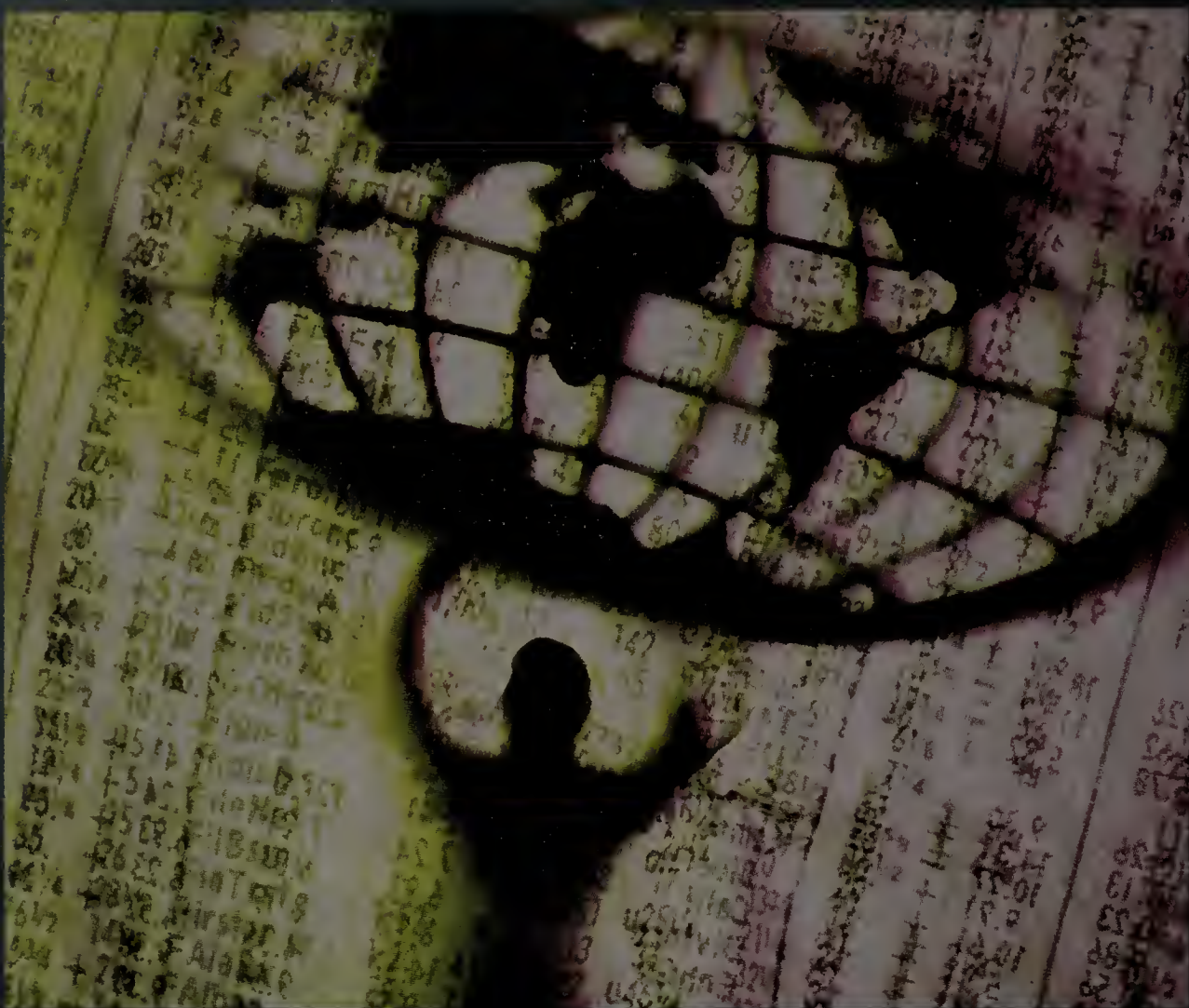
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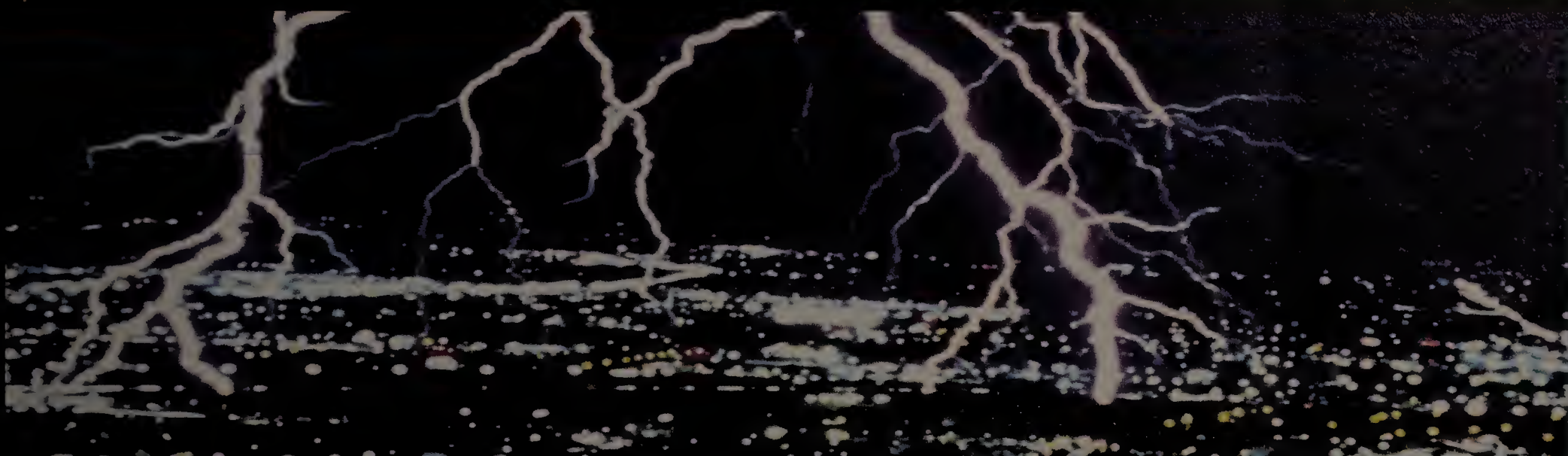


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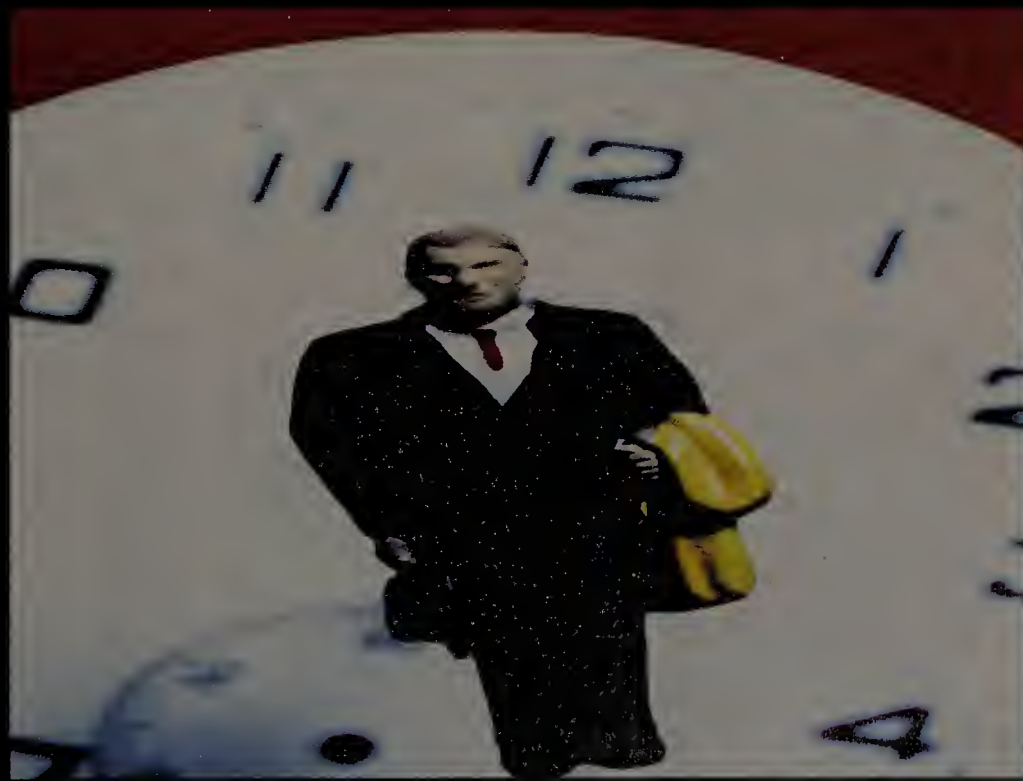
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NETWORKS THAT GO THE DISTANCE

Remote access war sweetens pricing

By Michael Fitzgerald

Remote access must be a honey of a market because new players are swarming to it like bees.

The buzz around this small — less than \$100 million — but rapidly growing market for remote access software has generated both a features war and somewhat of a price drop as well. By 1997, the market will triple to \$300 million, consultants said. It is an equation that can only mean sweet things for users.

For instance, security software maker McAfee Associates, Inc. will today resurrect its old NetRemote product when it brings out NetRemote 6.0 for \$50. A complete update of the old product, NetRemote 6.0 is based on Triton Technologies, Inc.'s CoSession for Windows.

each site," Eyrich said.

McAfee may indeed trump existing vendors with its low price point, but San Diego-based Stac will today enhance its product. It will introduce ReachOut 5.0, which adds remote node capability and significantly updates the product's remote access and file transfer components.

Its price point is just under \$100 a copy. Prior to the McAfee release, Stac officials said this was the new going rate for remote access software, down from an average street price of \$130 a copy last year.

Other new features include the following:

- Rapid Synch, which speeds up the sometimes agonizingly slow process of synchronizing files and directories.
- SmartSend, which only sends specific changes made to files

rather than updating by sending the entire file.

- Intruder Guard, a new set of security features.
- Windows 95 compatibility.

Suite coverage

Stac's goal was to put together something "like a remote access suite product," said John Bromhead, Stac vice president of marketing. With remote

control, remote node and file transfer as well as built-in support for basic networking protocols, ReachOut 6.0 will now cover all the bases in remote access.

Stac officials said they were going to use ReachOut 5.0 to push into the retail market, where PCAnywhere has been the No. 1 seller. ReachOut has traditionally focused on value-added resellers and direct sales to corporations.

Stac may find the retail path a bit like walking barefoot on asphalt in summer. Traveling Software's LapLink for Windows has charged into the market since its September release and is now challenging PCAnywhere for market leadership, according to research by PC Data, Inc. in Arlington, Va. McAfee's aggressive product offering should only increase the heat in the market.

Analysts said the shipment numbers represent the retail market and do not account for perhaps half the market. But the product war is real and will continue for some time, analysts predict.

Sybase database users miffed

By Jean S. Bozman

Sybase, Inc.'s delayed delivery of its two key databases for SunSoft, Inc.'s Solaris 2.4 kicked up a dust storm of concern on the Internet in recent weeks.

The issue was finally resolved after SunSoft supplied several software patches and software engineers went to work with Sybase. But Sybase support for Solaris 2.4 on Intel Corp. x86 machines remains unavailable.

The delay in certifying Sybase 4.9 and System 10 for the new operating system ended the week of March 20, according to Sybase. But users said they learned of the certification a week later through sales representatives.

Solaris users said they resented not being able to move existing Sybase applications to brand-new Sun machines running Solaris 2.4 — prohibiting them from cashing in on Solaris 2.4's 40% speed edge over Version 2.3. They had been complaining for months that they could not move to Solaris 2.4 while they were waiting for Sybase database releases to catch up.

"Having the operating system is one thing, but all the applications have to be in sync when you go forward," said Pompei Malik, manager of information systems at Brewers Retail, Inc. in Mississauga, Ontario. So far, Malik is sticking with Solaris 2.3 and the older SunOS 4.1.3 on 15 Sun servers running Sybase.



However, Sybase's database rivals did not have similar problems making their databases available for Solaris 2.4. Oracle Corp.'s 7.1 and Informix Software, Inc.'s 7.10 databases have been running on Solaris 2.4 since the operating system shipped last December. Both Oracle and Informix offer other versions of their databases for Solaris/Intel users, SunSoft confirmed last week.

CS First Boston in New York, with 1,000 Sun machines, runs SunOS 4.1.2 and some Solaris 2.3 with its Sybase databases. But it was unable to consolidate several large Sybase databases on large new servers. This meant it could not take advantage of Solaris 2.4's asynchronous I/O, which speeds database processing, said Jim Swanson, vice president of distributed operations for the firm's Fixed Income Trading Technologies business unit. Swanson said he installed 2.4 and Sybase System 10 last week on one of CS First Boston's 35 Sybase servers after Sybase finally made System 10 available.

Most affected were new users, who bought Sun hardware running Solaris 2.4 and then found they could not load Sybase onto the system. "It's usually the new guys who don't know about the rev syncing issue at all," said Charles Phillips, a principal analyst at Morgan Stanley & Co. in New York. "They go out and buy a new Sun machine, and they want to buy a new database."

SGI 3-D browser first in wave

By Jean S. Bozman

Silicon Graphics, Inc.'s recent announcement of a three-dimensional World-Wide Web browser may be the first, but it almost certainly will not be the last. Analysts said they expect the field of 3-D browsers to multiply rapidly in the coming months.

These browsers will dramatically change users' experiences while cruising the Web, allowing them to spin, rotate and "walk through" 3-D molecular models and architectural renderings.

"At the very least, it shakes up the World-Wide Web and the Internet within the next few months," said Tim Bajarin, president of Creative Strategies, Inc. in San Jose, Calif.

Visual seeds

Mountain View, Calif.-based SGI hopes to seed the market for 3-D Internet visuals, so it is offering its WebSpace 1.0 browsers at a nominal cost. There is an optional \$49 support fee from WebSpace 1.0 development partner Template Graphics, Inc. in San Diego. Template is also porting SGI's browser to several platforms as well.

WebSpace 1.0 runs on a variety of PCs and

workstations and is based on the emerging Virtual Reality Modeling Language (VRML) Internet software. VRML adds support for geometrie shapes to the HyperText Markup Language. The 3-D browser also uses a subset of SGI's OpenInventor graphics tool set.

By giving away browsers, SGI allows client machines to view complex 3-D graphics stored in ASCII files that can be downloaded from the Internet.

A 3-D limit

At the moment, 3-D browsing is limited to viewing only — users can download the Internet files, put them on the client machine and view them locally. A future update may include the ability to interactively exchange 3-D files between client and server, SGI said.

Scott Friedman, an architect and lecturer in the Department of Architecture at the University of California at Los Angeles, has tried the 3-D browser and said the 3-D effect looks more impressive on high-resolution workstations. Even so, 3-D on any client will change Internet viewing.

"You will be able to 'walk around' inside a 3-D rendering of a building and see what it would be like spatially without looking at traditional 2-D drawings or viewing blueprints," he said.

1994 estimated remote access market by units shipped

Total — 1.18M units*

Symantec's PCAnywhere	186,000
Norton-Lambert's Close-Up	185,900
Farallon's Timbuktu	177,000
Microcom's Carbon Copy	141,750
Traveling Software's LapLink for Windows	95,000**
Stac's ReachOut	71,500

*A combination of other vendors shipped 322,850 units
**Began shipping in September 1994

Source: International Data Corp., Framingham, Mass.

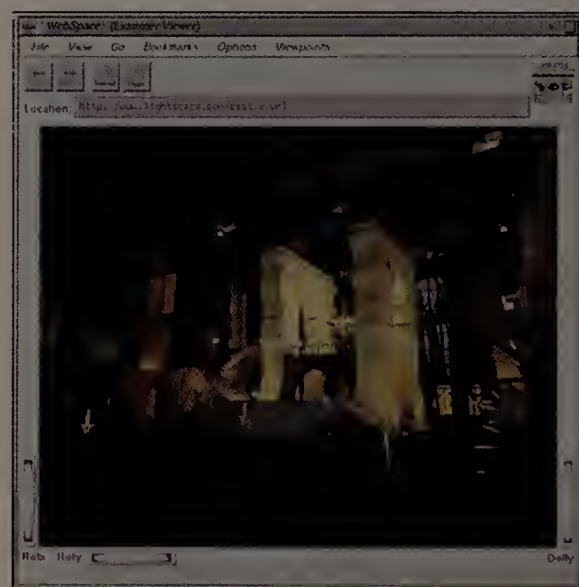
McAfee plans to draw users through its price point, which undercuts the going rate by about 50%. It also offers at least one year of free technical support and free upgrades, and it can be integrated with McAfee's BrightWorks 2.0 network management software.

PC access easier

Doug Eyrich, a network manager at OmniOffices, a real estate management company in Atlanta, has installed NetRemote 6.0 at three of its 23 remote locations to handle remote support.

Eyrich said that despite McAfee's lack of presence in the remote access market, he liked that it gave him access to all the PCs on a LAN from a single dial-up number. He said Symantec Corp.'s PCAnywhere forced him to dial in to the specific PC he wanted to control, and Stac Electronics' ReachOut was "cumbersome" in his information systems environment.

Using remote access software means "I don't have to have a highly skilled network person at



SGI's WebSpace 1.0 browser allows users to walk through 3-D molecular models

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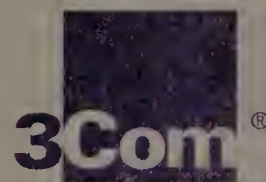
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NETWORKS THAT GO THE DISTANCE

COMPUTERWORE

Client/server faces up to enterprise

Corporate customers resist the classics

By **Robert J. Langley**
 While the client/server paradigm is a new phenomenon of old hardware and software, it is not the new paradigm.

Through its ability to bring together the client and server, the client/server paradigm is a new paradigm of old hardware and software. It is a paradigm of old hardware and software.

Client/server

Client/server is a new paradigm of old hardware and software. It is a paradigm of old hardware and software.

Client/server is a new paradigm of old hardware and software. It is a paradigm of old hardware and software.

Desktop leaders vie to meet 18 demands

By **Robert J. Langley**
 Desktop leaders are vying to meet 18 demands. It is a demand of old hardware and software.

Desktop leaders are vying to meet 18 demands. It is a demand of old hardware and software.

Highly anticipated

Switches hit the fast lane

By **Robert J. Langley**

Switches are hitting the fast lane. It is a demand of old hardware and software.

Switches are hitting the fast lane. It is a demand of old hardware and software.

Iceberg finally thaws out

Long-delayed storage drives ship

Iceberg finally thaws out. Long-delayed storage drives ship. It is a demand of old hardware and software.

Iceberg finally thaws out

Long-delayed storage drives ship

Iceberg finally thaws out. Long-delayed storage drives ship. It is a demand of old hardware and software.

THE MAN BEHIND BILBERT

By **Robert J. Langley**

The man behind Bilbert. It is a demand of old hardware and software.

Standardization

Standardization is a demand of old hardware and software.

Standardization is a demand of old hardware and software.

Industry debates certification

By **Robert J. Langley**

Industry debates certification. It is a demand of old hardware and software.

Bill Langley

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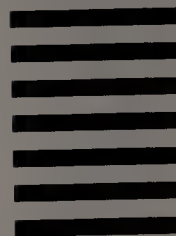


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Workgroup Computing

Netguard Systems, Inc. announced NSI 5000, a fault-tolerant subsystem protecting file servers in Novell, Inc.'s NetWare-based LANs.

According to the Seal Beach, Calif., company, NSI 5000 monitors a primary server for failures, then notifies support personnel and switches control over to a standby server in case of failure.

A single NetWare license is required for NSI 5000 because only one server runs NetWare at a time.

Pricing for NSI 5000 starts at \$6,200.

► **Netguard Systems**
(310) 799-5533

Portfolio Technologies, Inc. announced Office.IQ 2.1, a workflow-enabled document management system.

According to the Newark, Calif., company, Office.IQ 2.1 lets users share existing Windows application files in a distributed environment and uses distributed databases and replication to manage data.

Office.IQ 2.1 graphically maps the progress of workflow activities and lets users attach rules for data routing.

Office.IQ 2.1 costs \$895.

► **Portfolio Technologies**
(510) 226-5600

NetPro Computing, Inc. announced NetTools 5.1 for Banyan Systems, Inc.'s Vines.

According to the Scottsdale, Ariz., company, NetTools 5.1 provides an environment for defining and controlling Windows desktop configurations.

Version 5.1 includes administrator tools for managing Windows initialization files.

NetTools for Vines requires Vines 5.x or later, DOS 3.3 or later and Windows-compatible workstations.

Pricing for 25 seats starts at \$1,295.

► **NetPro Computing**
(602) 922-4206

Incite has announced Conversational Media, a product line of hubs and servers that integrates collaborative voice, data and video over LANs.

According to the Dallas company, Conversational Media is based on IsoEthernet, Microsoft Corp.'s Windows NT Server as well as Motion Picture Experts Group (MPEG) and H.320 image compression for full-motion video.

Products include Multimedia Hub, which integrates the LAN and voice net-

works; Multimedia Manager, server software that controls voice, data and video; and the WAN Hub, which extends communications across a wide-area network.

Prices start at \$450 per port.

► **Incite**
(214) 447-8200

Intellect Corp. has announced VisionQuest 2.29 for Windows, a LAN-based software meeting system.

According to the Dallas company, VisionQuest can hold simultaneous anonymous meetings through phone links. It also includes new decision-making tools for Notes.

Prices range from \$295 to \$1,295, depending on the configuration.

► **Intellect**
(214) 243-1706

Cylogic, Inc. has announced Voice User 2.1 for Windows for Workgroups 3.11,

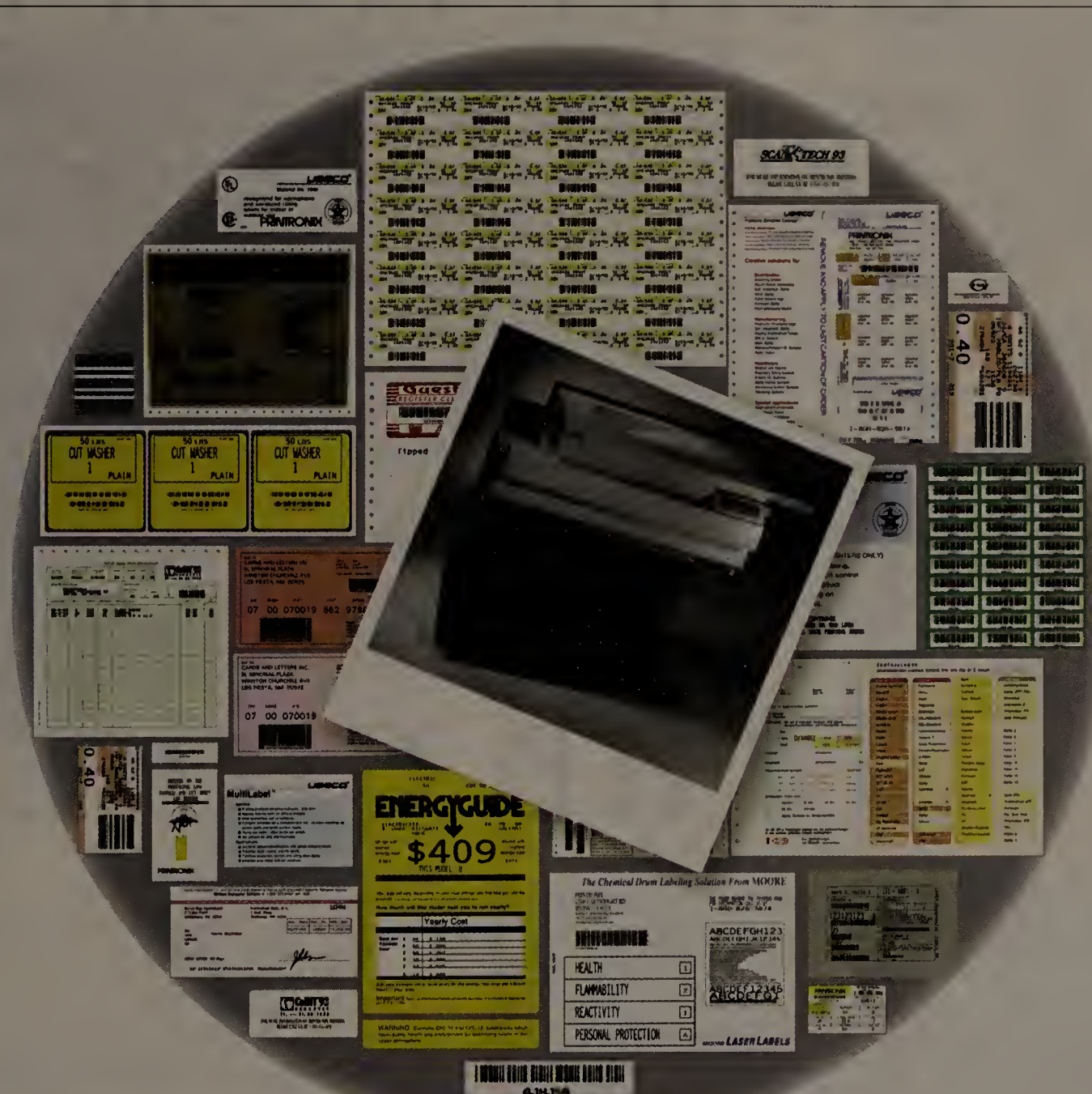
voice-recognition command software.

According to the Seattle company, the software includes voice commands for mail, scheduling and word processing applications.

Voice User features include built-in annotation that allows the addition of voice messages to documents and electronic mail.

Voice User costs \$49.

► **Cylogic**
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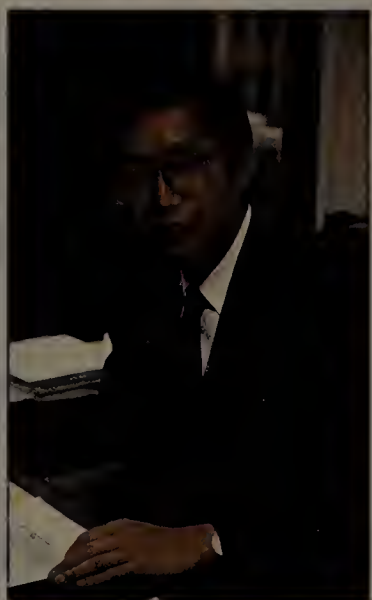
Mitsubishi trades up to frame-relay WAN

By Thomas Hoffman

■ **Mitsubishi International Corp. (MIC) is overhauling its U.S. network infrastructure to improve communication with its 80,000 worldwide trading customers.**

MIC's upgrade from an IBM SNA wide-area network to frame relay is expected to help the \$9 billion trading giant improve its electronic data interchange (EDI) and electronic-mail communications with its clients. More importantly, the project is also being viewed as a benchmark for its parent company — Mitsubishi Corp. in Tokyo — and its worldwide affiliates.

"The U.S. has a five-year [information technology] advantage over Japan, so MIC in the U.S. is [serving as] a model for Mitsubishi Corp.'s total [information technology] strategy," said Mitsuru Hashimoto, vice president and general manager of MIC's information and telecommunications systems division in New York.



MIC vice president Mitsuru Hashimoto expects the frame-relay network to be faster and more cost-effective

Future plans

The \$3 million project, which began last September, will connect MIC's 14 U.S. offices and 800 PCs. Once the frame-relay WAN is installed by year's end, MIC plans to link its Latin American offices in early 1996 via 64K-bit T1 connections, according to Hashimoto.



MIC's Latin American connections are critical because the economies and trading markets in these geographies are booming despite the Mexican currency crisis, according to Michele Forzley, author of *Winning in Foreign Markets* and director of Forzley & Co., a New York-based international trade consulting firm.

MIC expects to decide between frame-relay technologies from AT&T Corp. and MCI Communications Corp. by the end of this month, Hashimoto said.

As a prelude to the frame-relay project, MIC is upgrading its New York headquarters with IBM Token Ring LANs running Novell, Inc.'s NetWare 4.02 network operating system. When MIC's New York LAN project is completed later this month, the Token Ring LANs will be linked through an IBM 8260 concentrator to facilitate data transmission across its eight floors.

Hashimoto said he expects the frame-relay network to be faster and more cost-effective than the SNA WAN currently in place. For example, under the SNA network, MIC sends two EDI batch transmissions to its clients each day. Using the frame-relay network, MIC expects to transmit data to its clients within seconds of their requests, Hashimoto said.

Toward that end, he said, MIC is standardizing on Lotus Development Corp.'s CC:Mail systems and Crosscomm Corp.'s EDI software.

Vendors tout Rmon tools

Capability could improve client/server network management

By Patrick Dryden

LAS VEGAS

Allowing central support staff to monitor and maintain the components of their far-flung networks was the focus of several demonstrations of embedded management capability at the Network/Interop '95 trade show held here recently.

Some intriguing efforts highlighted at the show would boost the manageability of network building blocks — from hubs and switches to end-user devices such as printers, stations and modem-connected mobile systems.

Advanced Micro Devices, Inc. displayed a new version of its Ethernet repeater chip set that should let vendors build sophisticated management functions into cheap hubs.

AMD claims to have shipped 16 million ports of the prior version last year. The new chip, which should appear in products by mid-year, seeks to proliferate interoperable Remote Monitoring (Rmon) capability in mass-market stackable hubs, said Steve McRobert, senior product marketing engineer at the Sunnyvale, Calif., company.

Making tracks

The extra functions of an Rmon Management Information Base (MIB) can help central administrators track performance of segments throughout their networks via the Simple Network Management Protocol (SNMP).

AMD also built Rmon and SNMP software, licensed from Epilogue Technology Corp. in Albuquerque, N.M., into its chip to make optimal use of its new port switching ability.

This step will increase functionality for end users without increasing the price, said Karl Shimada, vice president of RisingStar Research, a market research firm in Lakewood, Colo.

"With this chip collecting all the statistics, vendors won't need to add an expensive RISC processor or take up a card slot in a hub chassis like they do today," Shimada

said. "AMD is saying you can get Rmon capability for free."

Users such as Blair Sanders look forward to this capability. Due to the processing demands on a hub's

CPU, most embedded Rmon products omit the packet filter and capture functions needed for remote

step," said Sanders, who develops automated management tools for TI's global network. "I hope that off-loading processing helps more vendors support all Rmon groups."

Another vendor showcasing an embedded Rmon agent was Applied Network Technology, Inc.,

which introduced Ethernet switches with a complete Rmon agent integrated in its own chips. This lets an Rmon client view network activity on each LAN segment or port for continuous management without intervention, according to the Westford, Mass., company.

On the MIB front, Epilogue and Xircom, Inc. in Calabasas, Calif., proposed a MIB that would contain object types specific to portable computers and remote network access.

The goal is to provide an agent

Rmon, page 61

A sample of vendors that are embedding network management into existing technology

VENDOR	NETWORK MANAGEMENT CAPABILITIES
ANT	Producing its own chip and embedding parts of Rmon in it.
Cabletron	Placing Rmon on an I-960 processor and placing it in some of its bridges and routers.
Networkth	Placing hub management onto AMD chips and putting it in a chip set.
Bay Networks	Placing a Network Control Engine on a SPARC processor to manage hubs

Source: Infonetics Research, Inc., San Jose, Calif.

protocol analysis and decoding displays, said Sanders, senior technical staff member for electronic communications at Texas Instruments, Inc. in Dallas.

"This sounds like the right

Cool tools tame networks

Administrators and support staff attending the recent Network/Interop '95 show found many new management tools to help them cope with cranky networks.

Simplicity was the common goal, whether target users are novice managers and branch-office supporters attempting to put SNMP agents to work or grizzled veterans seeking quick solutions to specific problems.

Product highlights include the following:

- **Accugraph Corp.** introduced an IP address manager that links with major network management platforms and dynamically extracts data from them. The El Paso, Texas, company plans to ship the IP module next month to help engineers request and automatically allocate subnetworks and validate and release existing addresses.

Accugraph expects prices to range from \$12,000 to \$15,000 per server and from \$1,000 to \$2,000 per client.

- **American Computer and Electronics Corp.** launched a starter kit version of NetPlus WinSNMP, a set of SNMP utilities. The \$99 package lets Windows users perform management functions. The Gaithersburg, Md., company will add an advanced kit in June and an expert kit in September.

- **Armon Networking, Inc.** introduced a network monitor to help plan configuration and capacity needs by mapping traffic across a network, not just on segments. A MIB extension to the Rmon standard, called EyeNet, gathers data from multiple Rmon probes, according to the Santa Barbara, Calif., company. The price is \$3,000.

- **Axon Networks, Inc.** in New-

Cool tools, page 61



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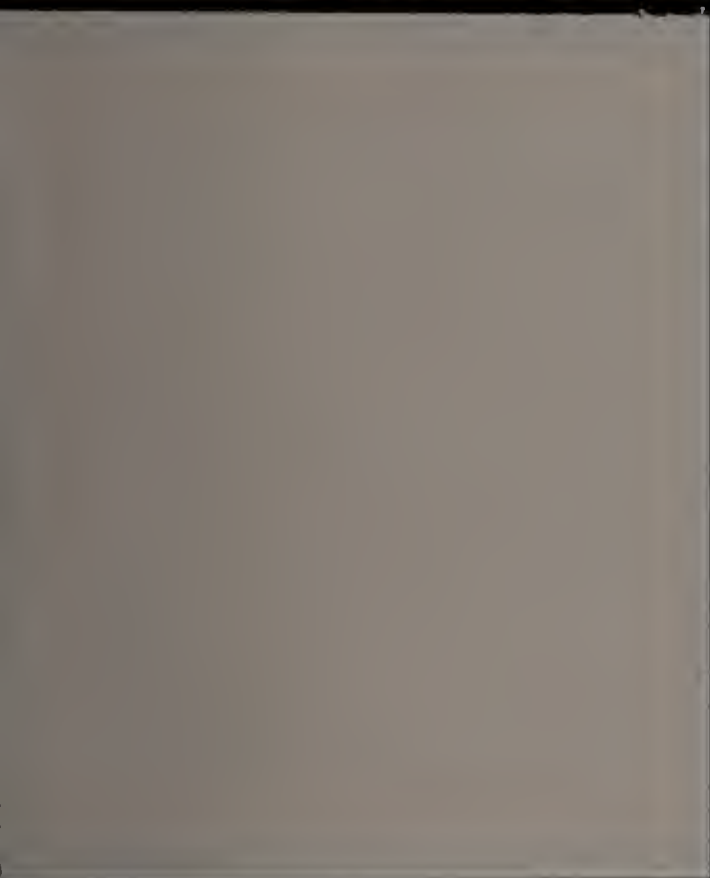
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LANtastic packs a powerful punch

Package integrates mail, fax, modem and Internet capabilities

By Laura DiDio
LAS VEGAS

Artisoft, Inc. recently teamed with a group of software vendors at Networld/Interop '95 to deliver integrated mail, fax, modem and Internet access capabilities into its peer-to-peer LANtastic network operating system — for less than \$200 per user.

The new product, dubbed LANtastic Power Suite, consists of six integrated products melded into a single software package. The Power Suite combines the base LANtastic network operating system with Lotus Development Corp.'s CC:Mail and Lotus Organizer network group scheduler; Cheyenne Communications, Inc.'s BitWare fax and modem communications software; Cheyenne's BitShare modem sharing and pooling software; and Netcom On-Line Communication Services, Inc.'s NetCruiser Internet access software.

By incorporating "best of breed" desktop application software packages from market lead-

ers into LANtastic, Artisoft is filling a void among businesses with 25 to 100 employees by providing them with scalability and one-stop shopping, said Sunil Padiyar, Artisoft's vice president of software products.

Stronger is better

One user who liked the new stronger communications support within the LANtastic Power Suite is Dave Geiver, network and technology supervisor at First Premier

Bank in Sioux Falls, S.D., a longtime LANtastic user.

"Chances are high that we'll purchase it. I especially like the fact that they're using established mail and communication software from recognized names like Lotus and Cheyenne. This means that I can implement Power Suite quickly and without the fear of bugs that are normally present in 1.0 product releases," Geiver said.

Stan Schatt, LAN Service director ana-

lyst at Computer Intelligence InfoCorp in La Jolla, Calif., said many smaller and remote users will

share Geiver's sentiments. Previously, these smaller users — who represent the biggest chunk of non-networked shops — would automatically have bought NetWare 2.x, he said.

But Novell is no longer selling NetWare 2.x, and Microsoft is phasing out its Windows for Workgroups.

"That just leaves Windows NT Server and NetWare 4.x — both of which are overkill in smaller environments," Schatt said. "And when Microsoft does ship Windows 95, it will be priced out of this market. Small shops don't have the 12M bytes of RAM that it takes to run Windows 95 sitting on their desktops."

Looking for bargains

Besides the integrated communications capabilities, Geiver said he hopes the LANtastic Power Suite will carry a street price of roughly \$30 per user in volume quantities of 100 — about the same cost as a single electronic-mail package.

Padiyar said the initial street price would be about \$53 in 100-user quantities. The LANtastic Power Suite will cost \$199 for a one-user license when it ships in June.

stream on top of slow remote access modem connections sounds risky, said David Greenberg, president of EMed Systems Corp., an Orlando, Fla., provider of outsourcing services in the health care industry. "You don't want some console sucking up users' bandwidth when they're just trying to get their E-mail," he said.

AMD and Hewlett-Packard Co. demonstrated a way to awaken network stations that have entered a dormant mode to reduce

power consumption. A special Ethernet frame, addressed to an individual energy-efficient station, tells that system to restore full power so the central staff can run backup, inventory or software updates on it over the network.

"Green PCs can only respond to keyboard or mouse input now, so someone has to walk there in order to do maintenance over the network," said Debbie Baron, product manager for HP PCs.

Some intriguing efforts highlighted at the show would boost the manageability of network building blocks.

Rmon

CONTINUED FROM PAGE 59

to help administrators track intermittent users, isolate problems with their PCMCIA cards and power management needs and optimize remote communication.

TI needs more resources to help manage the increasing number of portable units, Sanders said. "Tracking their communication attempts and failures would be as important as monitoring the traffic of wired nodes."

But adding another protocol

with Cisco Systems, Inc. yielded a version for Kalpana switches. Upgrades to Axon's analysis software for enterprise networks extend Rmon monitoring to major protocols and applications. It costs \$2,500 for the central management station and \$250 per probe.

• **Caravelle Networks Corp.** in Ottawa added entry-level fault-detection software for Windows PCs running on Novell, Inc.'s NetWare or TCP/IP networks. For less than \$200,

Watcher reportedly installs in minutes and provides a simple interface with on-line help.



• **Digilog, Inc.** introduced a LAN analysis and management system for Windows called LANVista. The Willow Grove, Pa., company expects to ship the system in June to work with WANVista, its protocol analyzer for end-to-end internetwork testing. Pricing has not been set.

• **LAN-hopper Systems, Inc.** in Atlan-

Cool tools

CONTINUED FROM PAGE 59

ton, Mass., unveiled a dual-port Rmon probe for monitoring Ethernet traffic on two segments or through a switch. FlexiProbe, which costs \$3,800, can watch two segments simultaneously. A model for switches, which costs \$3,300, dedicates the ports in order to listen and communicate. Also, a partnership

ta made its debut with switches and software that let troubleshooters connect one protocol analyzer to several network sources independent of each network's protocol.

• **The SNMP Workshop** in Danbury, Conn., introduced an integrated package of utilities oriented to SNMP processes instead of maps. SNMP Edge, available now in beta versions for Windows or SunSoft, Inc.'s Solaris for \$250 each, is expected to ship in September for \$695. — Patrick Dryden

Banyan's ENS for SPARC/Solaris eases integration

By Laura DiDio
LAS VEGAS

At the recent Networld/Interop '95 trade show here, Banyan Systems, Inc. unveiled a version of its Enterprise Network Services (ENS) for Sun Microsystems Computer Corp. high-end SPARC/Solaris-based platforms.

Banyan's ENS package incorporates all basic network operating system services, including Intelligent Messaging, the StreetTalk global directory, security and network management, said John Paul, Banyan's senior vice president of product and business development. The ENS offerings are targeted at large corporate networked environments that need an easy way to share and manage heterogeneous resources across the company.

ENS for SPARC/Solaris provides integration tools that allow PC users to simultaneously access a variety of Unix-based databases and applications. Unix workstation users can access files, printers and electronic mail across the enterprise. This has not always been the case, Paul noted.

Individual attention

Additionally, ENS' distributed management architecture, called DeMarc, gives network administrators the ability to manage the entire enterprise as well as individual subnets from any location, Paul said.

Wayne Plamondon, senior systems analyst in the Coordinated Law Enforcement Unit at the British Columbia Ministry of Attorney General's office in Canada, agreed.

"Unlike any other enterprise network solution, ENS for SPARC/Solaris allows us to port our intelligence applications from PCs to Sun's high-performance SPARC server systems while achieving full interoperability with our existing Vines network," Plamondon said. "And it also means that our users can now access high-end Unix applications without having to know Unix. This significantly reduces our costs in network administration and retraining personnel."

Move to client/server

Melody Gayeski, senior vice president of information services at American Savings Bank in Stockton, Calif., said the financial institution is deploying ENS for SPARC/Solaris as part of its plan to move away from a mainframe architecture and into the client/server arena.

"We're anticipating that installing ENS will result in both cost savings and interoperability as we migrate our financial/human resources systems to the client/server system now being rolled out on our existing corporate Vines network," Gayeski said.

ENS for the SPARC/Solaris platform will ship at the end of the month. Pricing is \$4,995 for a 10-user package, \$8,495 for 50 users, \$10,995 for 100 users and \$54,995 for a 1,000-user version.

ICL boosts X.500 features but interoperability lacking

Open Directory System based on 1993 standard

By Suruchi Mohan

ICL joined the handful of companies offering commercial X.500 wares with the recent announcement of its X.500 Open Directory System at Uniform 1995 in Dallas.

However, UK-based ICL will differentiate itself from its competitors by complying with the 1993 X.500 standard. Other vendors' offerings are based on the 1988 standard, and most are X.500-like, which means they do not necessarily interoperate with other X.500-based products.

The 1993 specifications for X.500 include access control, which enhances security, replication and mirroring — all features that are included in ICL's Open Directory System, said Tom McHale, technical marketing director at ICL Enterprises, the North American division of ICL in Reston, Va. These features were not included in the 1988 version and

are offered separately, he said.

"The market demand for the 1993 standard has not been overwhelming, but the features that get pulled in are good and will make [the product] more implementable," said Chris Byrnes, a program director at Meta Group, Inc. in Reston, Va. "It will take a while for the market to catch up."

He added that X.500 is the right answer for corporations that need applications for rapid identification of services or resources.

Interoperability essential

But X.500 must interoperate with other X.500 products if its usage is to be optimized. Right now, the only way for an X.500 system to talk to another is through a gateway, Byrnes said. This approach may be kludgy, but it gives users access to a wide range of directories that would otherwise be inaccessible.

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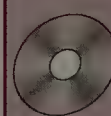
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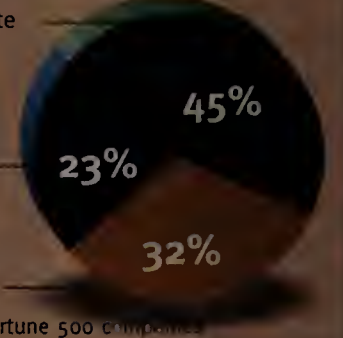
X.500 directory services purchase and deployment plans

Will evaluate systems within the next 12 months

No plans

Plan to purchase and deploy systems

Base: 96 Fortune 500 companies



Source: The Radicati Group, Palo Alto, Calif.

Like the X.400 standard out of which it grew, X.500 is extremely complex, according to Tim Sloane, an analyst at Aberdeen Group in Boston. Unlike X.400, however, X.500 has not yet been subjected to interoperability testing. Although it is virtually impossible to test the whole standard, a test bed can be created for certain feature functions, as in the case of X.400. But no such test bed exists for X.500 because users are not sure what functions need to be tested, Sloane said.

Overall, X.500 has great applicability to business. Not only is it a central repository for information, Sloane said, but it also provides a defined standard for offering public keys. However, one more vendor's offering will not hasten the adoption of the technology. "That will happen when vendors' X.500 implementations work seamlessly with one another," he said.

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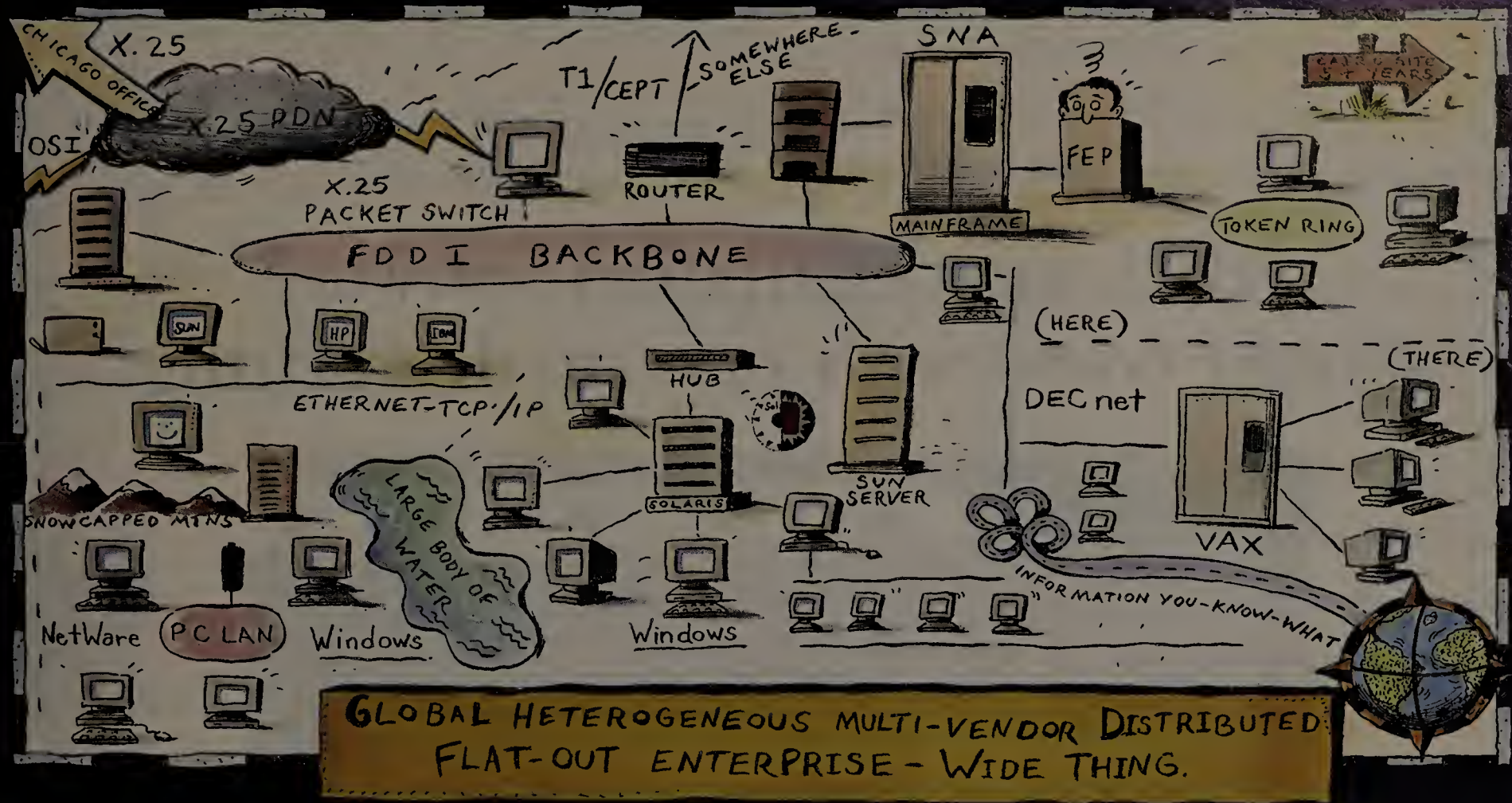
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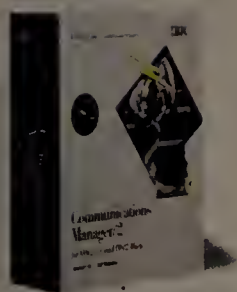
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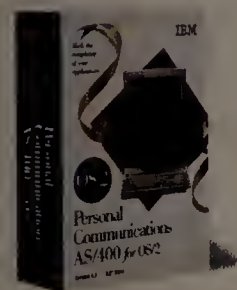
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Digital fails to articulate software strategy to users

By Neal Weinberg

Sun Microsystems, Inc. has its SunSoft unit. Unisys Corp. recently created USoft. And Digital Equipment Corp.? Well...

Ever since Chief Executive Officer Robert Palmer announced a major reorganization of the company last summer, Digital users have been waiting for a coherent software strategy to emerge from the Maynard, Mass., company.

And they are still waiting.

"It's a mystery because I think they don't really know what they're going to do," said Ed Homko, systems manager at Dr Pepper/The Seven-Up Co. in Dallas. "They keep changing direction a lot. It's like they try everything."

Lynn Berg, an analyst at Gartner Group, Inc. in Stamford, Conn., agreed. Digital has been "unable to figure out a way to sort out its software strategy. There is no business model," she said.

Digital has quietly consolidated its scattered software activities into a Software Business Group that falls under the Computer Systems Division. But it has yet to make a public announcement on the existence of the software unit. And it has not spelled out for its installed base which products to select for their specific needs, Berg said.

Chris Christiansen, an analyst at International Data Corp. in Fra-

mingham, Mass., called the company's lack of a software strategy "the dark side of Digital."

Between last year's sale of the cornerstone Rdb database and two years of "benign neglect" of its other VMS-based software titles, Digital has pretty much let its software business wither away, he said.

"They essentially killed the software business outside of middleware and system software," Christiansen said.

While Digital continues to come out piecemeal with new software, primarily middleware and network management, "I don't see a single, unified strategy," said

Jonathan Eunice, an analyst at Illuminata in Hollis, N.H.

On the plus side, Digital has accomplished its goal of ending long-standing competition with independent software vendors, according to Christiansen. On the downside, it "left a large part of the installed base stranded and looking at a forced migration at some point," he said.

For example, Randall Rushe, a senior scientist at Science Applications International Corp. in Panama City, Fla., said, "I really want to stick with VMS. For a robust, high-quality production operating system, it can't be touched."

But Digital sold its Ada programming language to a third-party soft-

Software sell-off

The following are sales of Digital products to various vendors

Date of sale	Product	Purchasing vendor
May 1994	DECcalc and DECslide	Touch Technologies, Inc. San Diego
November 1994	PDP-11 operating system	Mentec, Inc. Lowell, Mass.
	DECquery	Touch Technologies, Inc.
December 1994	Rdb database software	Oracle Corp. Redwood Shores, Calif.
January 1995	Mumps	InterSystems Corp. Cambridge, Mass.

ware company that has not committed to supporting VMS. If Rushe has to fill a government contract that requires the latest release of Ada, which he is currently unable to get, he will be forced to move off VMS.

"Then it's up in the air. It opens the universe up to other vendors," Rushe said.

Not a word

Eunice said that after an informal briefing by Digital officials at the December Digital Equipment Computer Users Society conference, he anticipated an announcement in the first quarter of this year. But now Digital appears to have gone "back to the conference table."

He conceded that in the past nine months, as the company battled to get back to profitability, it had higher priorities, such as improving its advertising and distribution strategies. Even so, Eunice said it is "reasonable to expect a path from your vendor," and that is where Digital has fallen short.

Taking a different view was John Mann, an analyst at Yankee Group in Boston. He said it made sense for Digital to cut costs on software development, considering its financial crisis. And it makes sense for Digital to disconnect from its installed base and attempt to sell software to new customers. "The installed base used to be an asset, not a millstone," he said.

Digital's Software Business Group's organizational chart



Defense agency puts R&D dollars to commercial good use

By Gary H. Anthes
ARLINGTON, VA.

"This is the smallest, most powerful computer in the world," said Howard Frank, picking up a metal frame the size of a large loaf of bread. "It is one half of a cubic foot and has 5 GFLOPS of computation in it."

Frank, head of the Computer Systems Technology Office at the Advanced Research Projects Agency (ARPA) here, said the computer, which is being developed by Honeywell, Inc., will become commercially available this year.

ARPA's goal is to put a supercomputer in outer space running commercially available software, but "ultimately you'll find machines like this on the desktop," Frank said. The computer runs the full suite of commercial software developed for the Paragon supercomputer from Intel Corp.'s Scalable Systems Division, Frank said.

By Department of Defense standards, ARPA's budget is small at \$2.7 billion, and

Frank's unit has just \$250 million a year to spend on some of the hardest problems in information technology. Nevertheless, the agency has managed to get enormous leverage out of its spending over the years (see box, page 68).

Recently Frank told *Computerworld* what commercial users might see coming out of ARPA-funded work.

CW: In the late 1980s, ARPA had a goal of developing computers able to perform at 1 trillion floating-point operations per second [TFLOPS] by the mid-1990s. How are you coming on that?

Frank: If the commercial world wanted to build a TFLOPS computer today, they could do that. The technology is there. But we are not concerned with building a TFLOPS machine for its own sake, but to build something where you don't have to build new software for it. So we are focusing more on scalable software.

CW: Is the chief obstacle to getting a real TFLOPS of performance on an application one of software?



ARPA's Howard Frank: Video and multimedia will move computing from kilobits to terabits

Frank: Yes. It's a chore to "parallelize" existing software now. We need compilers and tools to make that happen [automatically].

CW: Is your work in this area aimed primarily

at scientific applications?

Frank: It's more general than that. A lot of this is not looking at the application but at the inherent structure of the data. Transaction processing may be a greater beneficiary of massively parallel computing than any kind of pure scientific application.

CW: What is driving the quest for TFLOPS computing?

Frank: Video and multimedia will change the characteristics of the way people use computers, and that will drive the need for performance. Once you throw imagery into the picture, you've gone from kilobits to terabits without changing anything in between.

CW: What is your project with Tera Computer Co. all about?

Frank: Tera is a commercial system. Some people are saying that the Tera architecture, if it works, will be a breakthrough in the way operating systems and computers are built. The problem with lots of

Kodak hopes deals spur digital imaging growth

By Jean S. Bozman

Eastman Kodak Co. recently turned to a pantheon of computer giants — including Microsoft Corp., Hewlett-Packard Co. and IBM — to help move its digital imaging products into mainstream computer systems for consumer and business use.

Kodak's goal is to make its digital imaging technology an everyday component of business and Internet computing by the late 1990s. Earlier attempts to crack the business market have fallen short, industry analysts said, mostly due to a lack of broad-based support from key computer vendors.

Gary Schneider, an analyst at Bear, Stearns & Co. in New York, said Kodak must bring down costs while boosting profits. The new partnerships, if successful, could help, he added.

Window 95 entree

The most intense collaboration will be with Microsoft, which said it will ship Kodak's color management software in Windows 95. The two firms will comarket retail-store kiosks for photo reprinting.

Kodak will also resell HP's ink-jet printers with Kodak computer systems for insurance and medical applications. One New York insurance executive said compressed images would ease underwriters' reliance on mail and overnight delivery services.

"They may need to include one to five still pictures in their report, and you would prefer those to be attached as part of the computer file," said Harvey Berns, secretary of casualty technical services at The Home Insurance Co. in New York. "That's better than having to send a stack of pictures in the mail or by Fedex

in some cases. That's where we are now."

IBM will work with Kodak on image compression for secure credit-card and check payments, as well as on an Internet-based image transmission system. Another partner, Sprint Corp., will send multigigabyte Kodak-generated images over wide-area networks and store them in central database repositories.

Small piece of the pie

Kodak Chief Executive Officer George Fisher said revenue related to digital enhancement of standard photographic images, digital capture of images and digital storage accounts for just \$500 million of the company's \$13.5 billion in annual revenue. The

company's progress in this arena has been hampered by its "go it alone" approach and concerns about damaging Kodak's traditional chemical and paper product line, Fisher added.

Ironically, Kodak outsourced its information systems organization in 1989, only to bring some functions back in-house in recent years. An IS perspective might have pointed out some of Kodak's missteps in the computer industry, said Peter Kastner, an analyst at Aberdeen Group in Boston.

Now, on the advice of consultants, Kodak will distribute some software for free and publish application interfaces to create de facto standards with broad support.

Carl Gustin, vice president and general manager of Kodak's Digital and Applied Imaging organization, said the company will support as many computer systems as possible. "Unix is one of the platforms we have to address, but we're also moving to Windows, Windows NT and to Macintosh," he said.



Niche software finds its market

By Rosemary Cafasso

TSW International, Inc. recently announced plans to integrate its maintenance management software with the Oracle Corp. set of financial applications.

With this move, Atlanta-based TSW hopes to position its software — typically used by manufacturing companies to track equipment and other capital investments — as a mainstream client/server offering.

TSW said the Oracle deal would allow users to integrate capital equipment data with their financial operations. That is the chief reason Edmonton Power in Edmonton, Alberta, selected TSW's MPAC application suite.

"We were looking for a company with [a] strong work management product," said Kevin Brown, Edmonton Power's director of information technology. He said he was most attracted by TSW's plan to integrate its package with the Oracle suite.

"We assign resources and materials to the work order," Brown said. "So, you need to link that to purchasing and financials. That's why we need the integration."

Crowded field

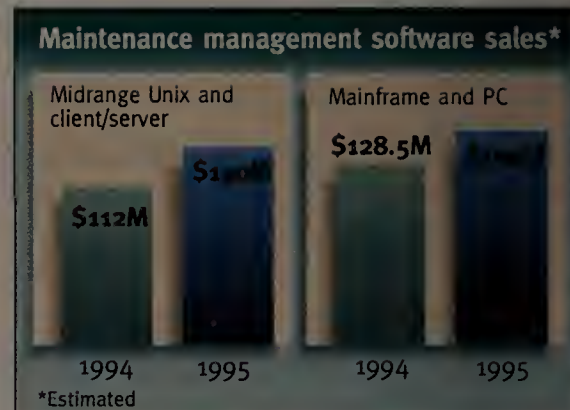
Currently, maintenance management is a small niche in the manufacturing software market. TSW is one of the more well-known companies in a market crammed with roughly 200 contenders, according to market analysts. The best known players are companies such as SAP America, Inc. and Marcam Corp., which include maintenance management functions in their products suites.

Still, TSW brought in about \$30 million in revenue last year. And despite such a

large group of players, the total market is expected to generate revenue of about \$300 million this year, according to market analysts.

"This has been a confusing, muddled market," said Bruce Richardson, an analyst at Advanced Manufacturing Research, Inc. in Boston. "TSW is trying to break out of the pack."

Industry analysts said they do not expect the maintenance management mar-



Source: Plantwide Research Group, Billerica, Mass.

ket to experience the rapid growth of other client/server software segments. Nonetheless, it will continue to be a critical function for manufacturing companies.

Cliff Hardaway, an information systems manager at a consumer products company and a TSW user, said his company will eventually upgrade to the client/server version. "We recognize that we have to be more reliable and more productive at a lower cost," Hardaway said.

His company is installing the TSW software in phases and is currently in production with an inventory management component for factory equipment. He said the waiting time for the warehouse to deliver equipment parts has decreased by 15 minutes per day per repair person because the company is keeping better track of what is in stock.

Defense agency

CONTINUED FROM PAGE 67

of massively parallel machines is that they operate at very high rates theoretically, but when you take a real application, they operate at much lower rates. The goal [of the Tera project] is to deliver sustained performance as opposed to peak performance.

CW: What sort of applications will that computer be geared for?

Frank: Every kind of application. If it really does do what a lot of people believe it will, it's the way to build computers.

CW: Can you give an example of an interesting networking project?

Frank: We are working on some technologies that allow you to use multiple different waves over the same fiber-optic cable. Instead of one wavelength carrying data, you might have a dozen. It's feasible. The question is how far can you push it. A combination of companies are working

on this with us — IBM, AT&T, Bellcore and others.

CW: What are you doing that might help Internet users?

Frank: We are looking at where the Internet can go in terms of scaling. We think an Internet with 30 million or 40 million nodes is trivial. We are thinking of a world where you have 40 billion nodes. But the Defense Department needs to manage its assets, and if there was a little [networked] smart tag on every important piece of equipment, the Defense Department could follow where it was. The Defense Department needs that yesterday for asset management, but it's also exactly what the commercial world needs.

CW: What else?

Frank: We are initiating a very significant security program. It will look at security tools, hardware, operating systems, applications, networks and technology for developing robust systems. We want to create a family of security technologies that are modular, commercially produced and plug and play.

For example, we are working on encryption technologies so that you can just plug the appropriate type of cryptographic algorithms into [your application].

Established in 1958 in response to the Soviet launch of Sputnik, ARPA has sponsored the development of a staggering array of information technology, such as:

- ▶ Packet switching, the ARPAnet and the Internet
- ▶ Computer time-sharing
- ▶ Interactive computer graphics
- ▶ Artificial intelligence
- ▶ Image understanding and processing
- ▶ Massively parallel computers

Technology in the field

The mission of ARPA's Computer Systems Technology Office, according to director Howard Frank, is to give U.S. military forces a strategic advantage through information technology.

Last November, ARPA supported a set of military exercises, called Synthetic Theater of War, in which the participants could not distinguish fact from fiction.

Some of the input came from real troops with real weapons; some came from devices such as aircraft simulators; and some were generated entirely by computer. "Mission commanders did not know the difference, so they could command those forces as if they were all live forces," Frank said. "It proved conclusively that this could be used as a replacement for real human beings in real machines for training and rehearsal."

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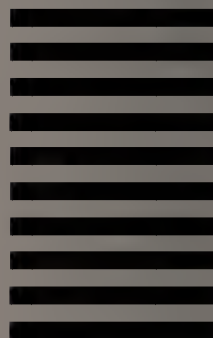
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Andrew Corp. has announced SuperStar/400 Plus, a 5250 star repeater that creates star-wired IBMAS/400 networks.

According to the Orland Park, Ill., firm, SuperStar/400 Plus turns daisy-chain cabling into a flexible, star-wired configuration and provides noise-reduction circuitry that ensures a reliable connection between hosts and devices.

The product comes with automatic polarity detection and correction. Each host/controller and device port has an LED to indicate line status.

Prices range from \$595 to \$1,095, depending on the configuration.

► **Andrew**
(708) 349-3300

Red Brick Systems has announced Red Brick Warehouse VPT, a client/server relational database management system for IBM's AIX 4 operating system on the RS/6000 platform.

According to the Los Gatos, Calif., company, Red Brick Warehouse VPT lets customers develop and deploy business management applications quickly, access consolidated and detailed business information and query large databases of information gathered from disparate sources.

Red Brick Warehouse runs on a range of hardware configurations from single-microprocessor systems to large commercial parallel processors.

Pricing begins at \$40,000.
► **Red Brick Systems**
(408) 354-7214

Netwise, Inc. has announced TransAccess DB2/Integrator SQL Accelerator, a component of DB/2 Integrator for database administrators.

According to the Boulder, Colo., firm, TransAccess DB2/Integrator generates, substitutes and executes DB2 plans. It also provides database administrators with mainframe DB2 access from desktop applications with development tools such as Sybase, Inc.'s PowerBuilder and Microsoft Corp.'s Visual Basic.

Pricing begins at \$50,000 for 50 users.
► **Netwise**
(303) 442-8280

Symark Software has announced UserManager, user account management for Digital Equipment Corp.'s OpenVMS systems.

According to the Westlake Village, Calif., company, UserManager lets sys-

tems managers limit access to user databases, manage remote and local systems simultaneously and modify groups of users across their networks. It also includes several features to help automate data centers.

UserManager features a character-based interface.

Pricing for UserManager starts at \$500 per machine.

► **Symark Software**
(818) 865-6100

Mike Parker & Associates, Inc. has introduced Gendrp, a control file of database objects.

According to the Broken Arrow, Okla., company, Gendrp supports the V7 Drop Table Cascade Constraints option for generating cascading foreign key constraints. It also generates the document description language for views, procedures and functions. Gendrp is part of the SQL/Admin for Windows package, which costs \$225 for a single CPU license.

► **Mike Parker & Associates**
(918) 455-0318

Product short

Corollary, Inc. has unveiled the CBII/4000, a multiprocessing computer that supports up to four Intel Corp. Pentium processors, 512M bytes of memory and RAID disks. Cost: \$20,000 to \$80,000, depending on configuration. Corollary, Irvine, Calif., (714) 250-4040.

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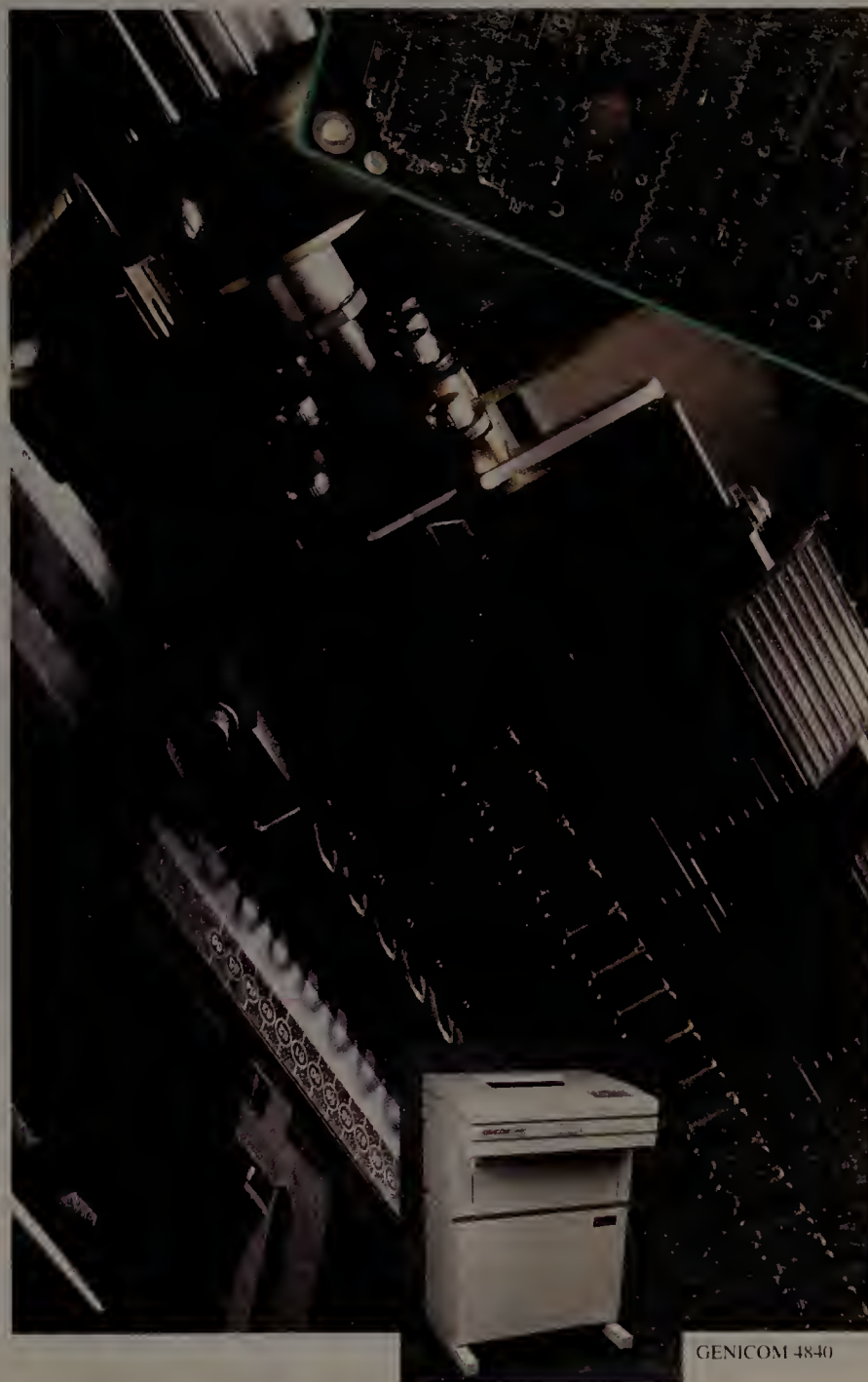
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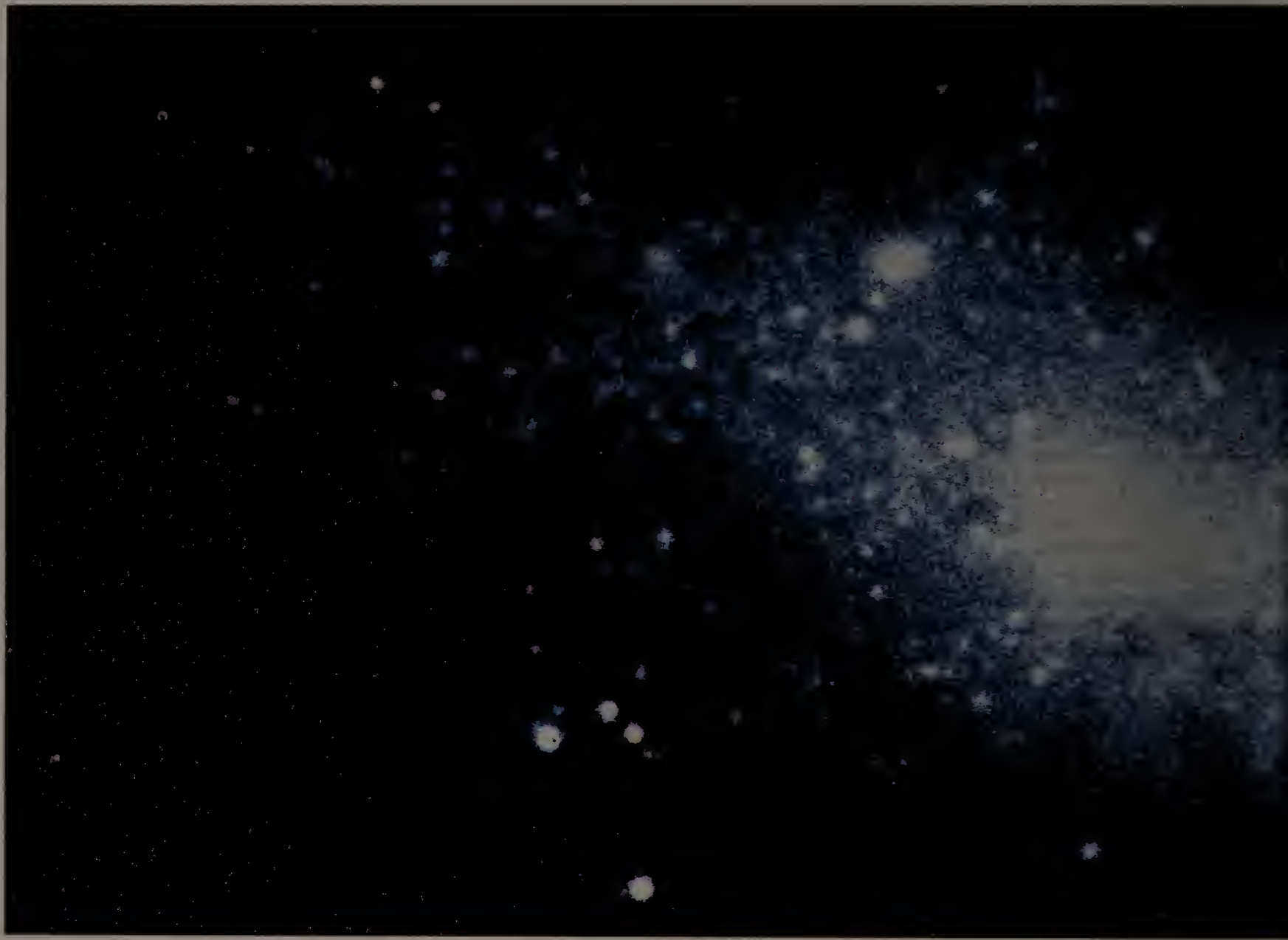
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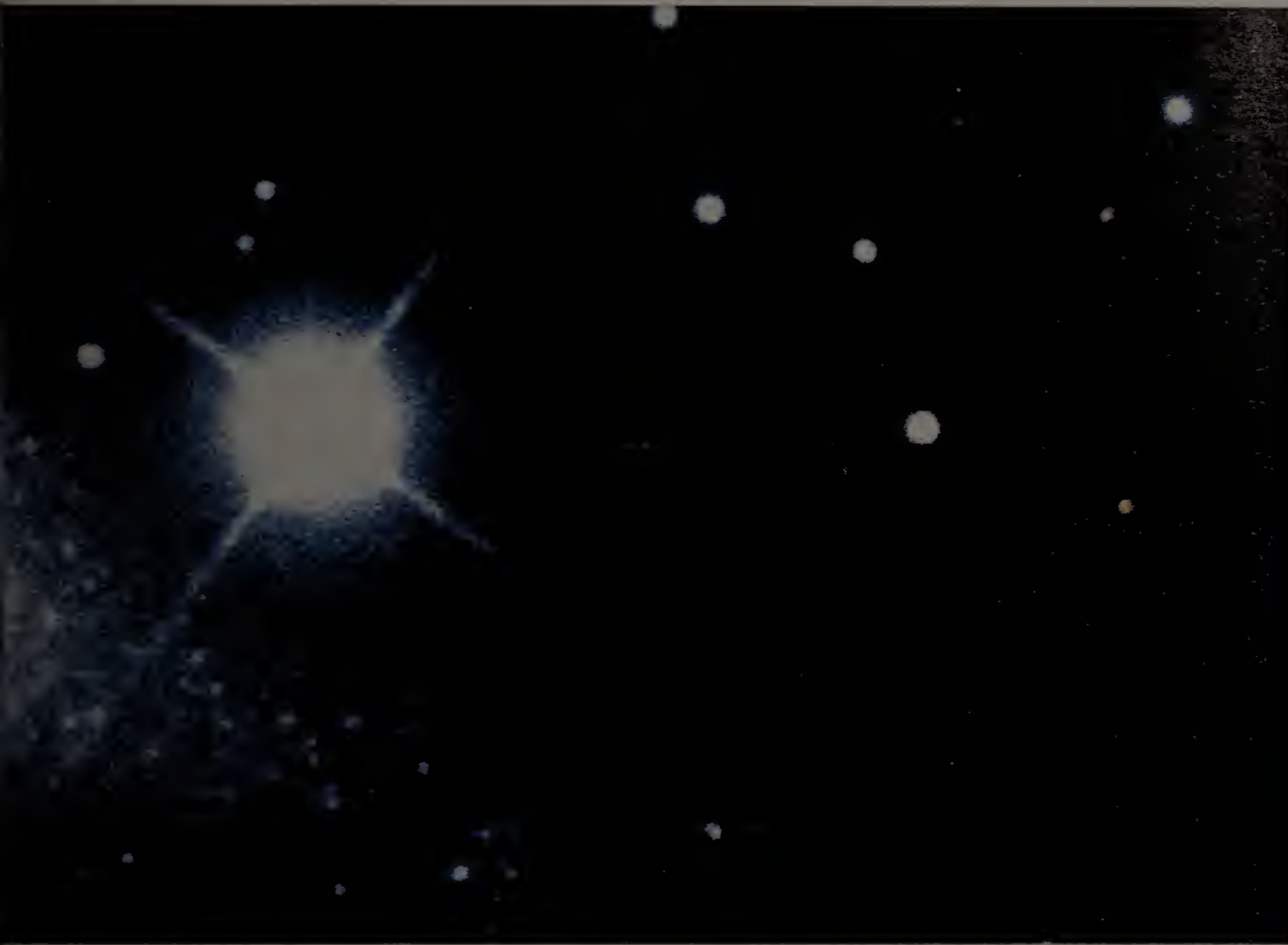
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Comshare agents aid with database searches

By Rosemary Cafasso

Users of Comshare, Inc.'s decision-support software can now employ software agents to handle boring and repetitive data searches.

"If analysts and accountants aren't looking for data, they can spend their time doing other things," said Hal Zesch, assistant controller at Valero Energy Corp.

grammed to watch for data that somehow breaks a pattern or is worth noting to users.

Industry analysts said that among decision-support software providers, Comshare is out in front with this approach to agent technology. Comshare competes with a host of decision-support and business intelligence software companies such as IRI Software in Waltham, Mass., and Pilot Software, Inc. in Cambridge, Mass.

"The reason it's interesting is it is exception-based reporting, and that's the way to go," said Bobby Cameron, an analyst at Forrester Research, Inc. in Cambridge, Mass. Cameron said flagging only data shifts and changes is far more efficient than delivering large amounts of data to the desktop.

"We think it has the potential to be a substantial productivity item," Zesch said. "But like any other new tool, it will take a while."

Zesch said his staff has been testing the agent technology for about a month and is finding that it can off-load a lot of tedious work.

"As long as you can define what you are looking for, you can set the robot to look for most things," he said.

Slow to sign up

Graeme Stager, an information manager at Loewen Group, Inc. in Vancouver, British Columbia, is a Comshare user who recently viewed a presentation on the Detect and Alert line.

While Stager said the products looked useful, he is not ready to sign up.

"What I told Comshare after their presentation is what I would really like is an agent that looks for correlations in the data for me," Stager said. "What I would envision is an agent browsing data and looking for correlations that I wouldn't even know about."

The Comshare technology includes three components: robot server software, which handles the rules and administrative tasks for agents; alerts, which send warnings or noteworthy data to users; and a client piece, which uses a newspaper metaphor to present information being delivered by the alerts.

The company said its initial Commander Robot is shipping now, while the Notes Robot will be available in June.

What's an agent?

- ▶ A small software program set up for background or remote tasks.
- ▶ Monitors networks or databases and sends alerts.
- ▶ Suited for repetitive tasks.
- ▶ Not recommended for ad hoc searches.
- ▶ Programmable to conduct tasks at certain times and with certain frequencies.

in San Antonio. The company beta-tested the Comshare technology and plans to use it in marketing and accounting applications.

The Ann Arbor, Mich.-based software company officially launched its agent technology last week as the Detect and Alert product line. It will sell the agents as "robots" for particular products. The agents cost \$38,000.

The agents will initially work with the company's Commander multidimensional database server and will eventually be available for Notes.

In addition, the company will extend the agents beyond Comshare's database products to its financial and retail applications.

Agents defined

Software agents are essentially small software programs written to perform background tasks. They typically monitor networks or databases and other information sources and flag data they have been instructed to find.

Another common function for agents is filtering information before it hits the desktop, so users receive only the data they need or get warnings of unusual data.

The Comshare technique is similar to these approaches. The Detect and Alert robots can be pro-

Users slow to face year 2000 conversion

By Mitch Betts

Surveys show that fixing the "year 2000 date problem," which will make systems with two-digit date fields go haywire, can cost from \$5 million to \$50 million for a large corporation.

So it is not surprising that some of the heavy hitters in the software and consulting industries — smelling profits to be made — are jumping into a market that previously was populated by tiny or little-known vendors.

Just in the past few weeks, the following announcements were made:

- Accounting firm Coopers & Lybrand teamed up with Phoenix-based tool maker Viasoft, Inc. to help information systems departments deal with the year 2000 issue.

Other alliances between Big 6 accounting firms and tool vendors are expected.

- Computer Horizons Corp. in Mountain Lakes, N.J., announced Signature 2000, which includes a scanning tool to identify all date fields in a company's inventory of applications as well as a "replacer" that reformats date fields and updates the application code.

- Cap Gemini America, Inc. in New York announced its TransMillennium software re-engineering service — including an expert system — for fixing mainframe Cobol applications with year 2000 problems.

Other software vendors in the "year 2000" market include ADPAC Corp. in San Francisco; Isogon Corp. in New York; MainWare, Inc. in Maple Plain, Minn.; and Quintic Systems, Inc. in Des Plaines, Ill.

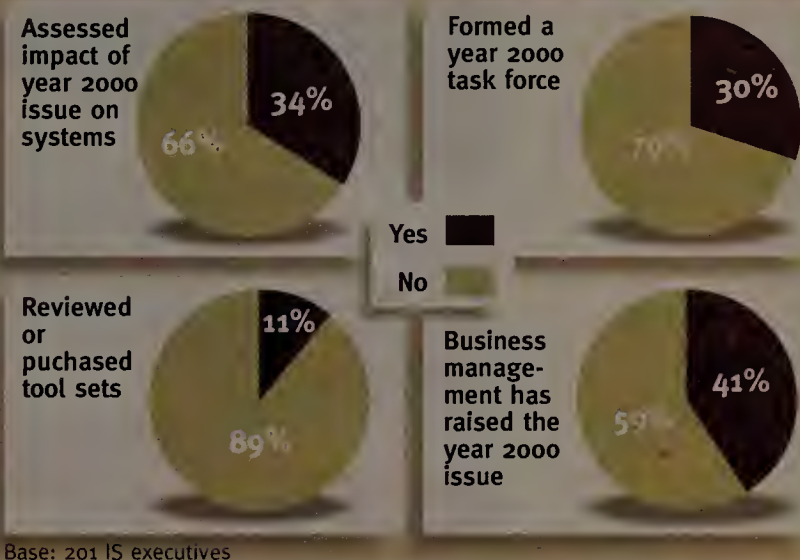
In essence, the problem is that applications with two-digit date fields will see 00 in the year 2000 and interpret it as 1900. As a result, date-sensitive calculations will be thrown off for mortgages, insurance policies, anniversaries, bonds, forecasts, inventory replenishment, contracts, leases, pensions, receivables and customer records [CW, July 11, 1994].

One advantage to having big firms enter the field is that it increases the visibil-

ity of a problem that many companies would prefer to ignore because of the expense. "This has always been a technology issue trying to get management attention," said the IS manager at an East Coast manufacturing company.

"The big boys will do more advertising and promotion," agreed Bill Goodwin, president of

Has your organization taken the following actions?



Source: Howard A. Rubin for Cap Gemini America, Inc., New York

the consulting firm 2000AD, Inc. in New York. But he said he remains worried that "there will still be a panic in 1997 because most companies are still putting it off or just starting to think about it."

Procrastinators abound

Indeed, a recent survey of 201 IS managers found that two-thirds are avoiding the issue, and many are waiting until 1998 to do something about it, said Howard A. Rubin, an independent software consultant in Pound Ridge, N.Y. The concern is that by then, there may be a shortage of qualified programmers and consultants — as well as a shortage of money — to do a rush job, Rubin and Goodwin said.

Rubin's survey, commissioned by Cap Gemini America, found that many IS managers plan to fix the date problem during regular software maintenance or when they rewrite the applications. However, less than 8% of the managers have explicit plans to deal with year 2000 issues when they rewrite code.

Mike Gladieux, a systems project coordinator at the University of Michigan in Ann Arbor, said the newcomers will have little or no effect on his plans because the university has already started an overhaul.

Year 2000 issues are a high priority for our information technology organization

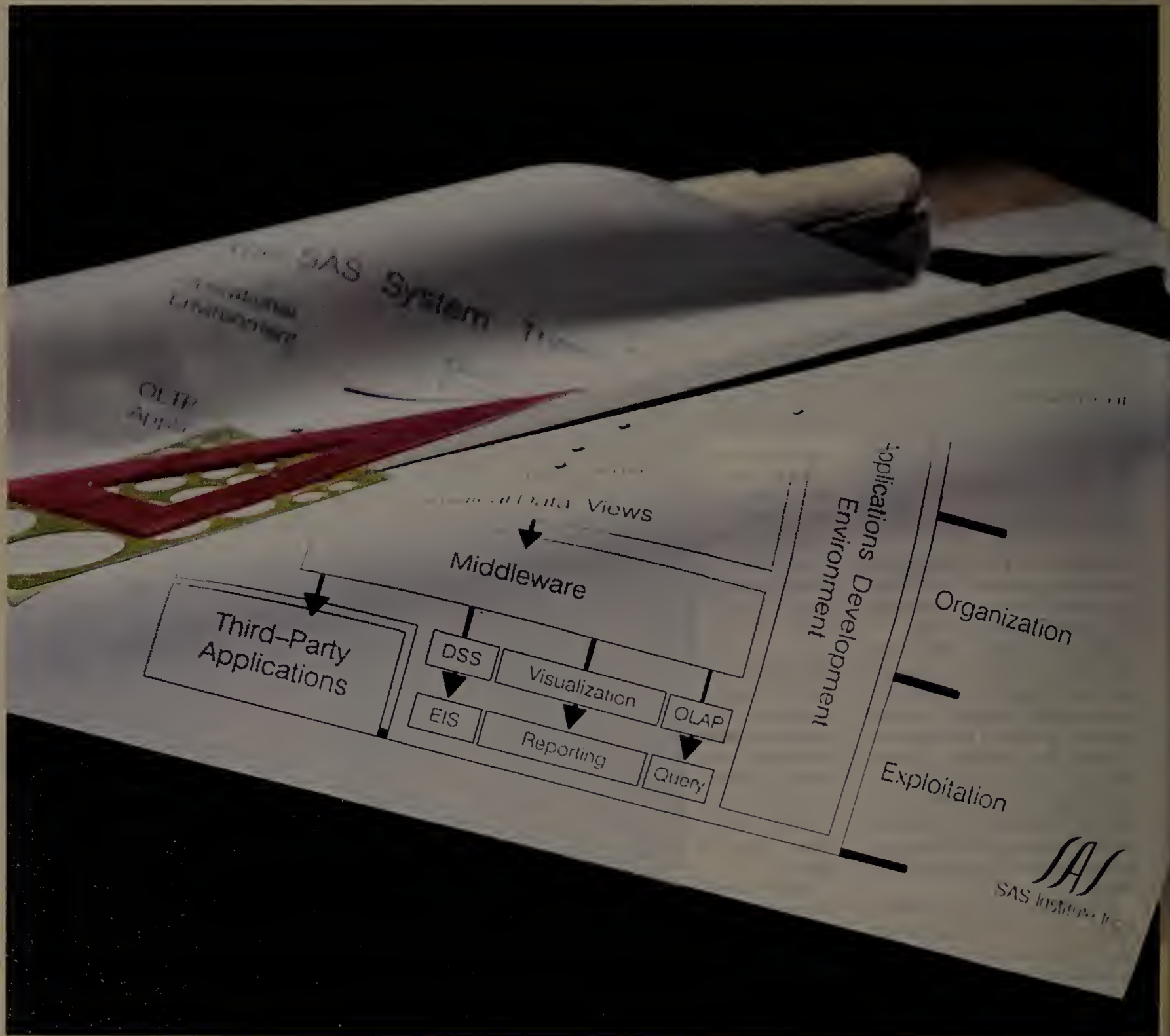


Source: Howard A. Rubin for Cap Gemini America, Inc., New York

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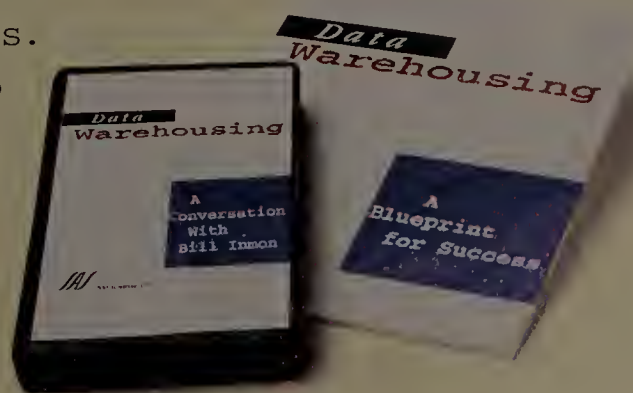
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Choice of HTML tools hits market

By Ellis Booker

The market for HyperText Markup Language (HTML) authoring tools recalls the early days of word processing: dozens of systems — many of them free for the downloading — jockeying for market share.

HTML is a simplified implementation of Standard Generalized Markup Language — a way of coding ASCII documents. HTML tags inserted into documents designate the format of text and headers and can also contain pointers to other HTML pages, graphics, images or audio or video files. When viewed via an Internet browser, the tags are invisible.

Tough decisions

Nevertheless, for users trying to pick an authoring tool for their companies, the profusion of products makes the choice difficult.

Adding to the confusion is the fact that HTML editors are also arriving from virtually every word processing software vendor — notably Microsoft Corp. and WordPerfect, the Novell, Inc. Applications Group (see chart).

"Right now, we see the market as a free-for-all with no horses pulling out in front," said Jim Bair, a re-

search director at Gartner Group, Inc.'s Boston office. But he said the size of the vendor may tell more about winners and losers in this environment. "We suspect the market may go to those who have a large installed base of word processing customers," Bair said.

The following product categories provide some perspective on the market:

- **Stand-alone or companion.** Companion systems use templates and work with existing authoring tools such as WordPerfect.
- **Validating or nonvalidating editor.** Validating editors test to see if HTML tags are correctly paired.
- **WYSIWYG or Raw.** Raw editors show the HTML tags and require a knowledge of what the output will look like. WYSIWYG

systems target a broader audience and show how the HTML will look when viewed via a graphical Internet browser such as Mosaic or Netscape Communications Corp.'s Netscape.

In fact, coding documents in HTML for publication on the World-Wide Web is only part of the answer. Managing large document repositories — more than 100 or 200 pages — is increasingly becoming an issue.

In response to this issue, document management vendors have entered the fray.

This week, for example, Information Dimensions, Inc. (IDI) in Dublin, Ohio, will announce a Web server version of its popular Basisplus object/relational database for document repositories.

Like other document management com-

panies that have recently entered the Web server market, IDI will sell its Basis Webserver package on the strength of its document management engine and ability to convert documents from a variety of formats such as word processors, ASCII text, native HTML and so on.

Basis Webserver will have a starting price of \$15,000 and will be initially available on several Unix platforms. A Microsoft Windows NT version is due by year's end.

A sampling of HTML authoring tools

Vendor/Product	Description	Availability/Price
SoftQuad Toronto HotMetal 1.0+	Supports HTML 2.0. Will be bundled with Spyglass' Enhanced Mosaic 2.0.	Via anonymous file transport protocol sites listed at SoftQuad's home page (http://www.sq.com)
Novell Provo, Utah WordPerfect Internet Publisher for Windows	A free add-on for WordPerfect 6.1. Includes templates for HTML documents, conversion utility for WordPerfect documents and Netscape's Navigator browser.	Can be downloaded from Novell's Web home page (http://www.novell.com) and elsewhere; SGML edition is \$595
Quarterdeck Santa Monica, Calif. WebAuthor	An add-on tool for Microsoft Word for Windows 6. Supports standard and nonstandard HTML tags (Netscape's and proposed HTML 3.0 tags). Optional printing of hypertext links and on-line images.	\$149.95 through retail channels; \$99.95 direct from Quarterdeck
Microsoft Redmond, Wash. Internet Assistant	An add-on for Word 6.0. Supports OLE-embedded objects, text wrapping and customized tool bars for Word.	\$5.50 if shipped to customer or can be downloaded from Microsoft's home page (http://www.microsoft.com)

Briefs

CAD tools spin off

Matra Datavision, Inc. has created a new business unit, CAS.CADE, to sell and support its object-oriented software development tool set named CAS.CADE/SF. The business unit will be located in Les Ulis, France, with U.S. operations based in Tewksbury, Mass. The product set will include a framework for application integration; a set of development tools, including class definition language, class browser and data dictionary; and a suite of object class libraries and services.

Databases go AIX

Los Gatos, Calif.-based **Red Brick Systems** and **Informix Software, Inc.** in Menlo Park, Calif., said last week that their databases are now available on AIX 4.0, the latest version of IBM's Unix operating system.

Subs standardize

Subway Sandwiches and Salads, the Milford, Conn.-based food franchise with 10,000 worldwide locations, has announced it intends to standardize on **Computer Associates International, Inc.**'s CA-OpenIngres database server.

A reminder that for enterprise-wide client/server development, integrated accounting, and decision support, slow

Speedware Corporation is an international organization with 25 offices around the world, thousands of satisfied customers, and products with a proven track record.

Application Development

VPE, Inc. has announced WebBuilder, a system for developing and deploying Internet applications.

According to the Alexandria, Va., company, WebBuilder offers an application development tool set that visually builds HyperText Markup Language forms and lets users access applications directly over the World-Wide Web.

WebBuilder includes a development and application server license, documentation, training and consulting and support.

WebBuilder costs \$17,500.

► **VPE**
(703) 684-3700

Visigenic Software, Inc. has announced the ODBC 2.0 Software Developer's Kit (SDK), a data access product for database application developers based on Microsoft Corp.'s Open Database Connectivity (ODBC) specifications.

According to the San Mateo, Calif., company, ODBC 2.0 SDK lets developers write database-independent C and C++ applications and deploy them across any platform. ODBC 2.0 SDK comes with a Driver Manager, header files, programmers reference and sample programs.

ODBC 2.0 SDK costs \$995 per developer.

► **Visigenic Software**
(415) 286-1900

Rasmussen Software, Inc. has announced Intelligent Code Editor (ICE) 4.0 for Cobol, C and Pascal programmers.

According to the Portland, Ore., firm, ICE 4.0 can deal with specific user requirements during an editing session. It

can also compare two large files and highlight differences.

ICE 4.0 for DOS costs \$249. Unix versions start at \$350.

► **Rasmussen Software**
(503) 624-0360

Cooper and Peters, Inc. has announced Edit, a programmer's editor for Visual Smalltalk 3.0.

According to the Boulder, Colo., company, Edit offers code-aware and formatting features, color syntax highlighting, cross-method find and replace, code-sharing framework and hypertext searching.

Edit costs \$295.

► **Cooper and Peters**
(303) 546-6828

Delrina Corp. has announced FormFlow Software Developer's Kit.

According to the San Jose, Calif., company, the kit lets users add electronic forms features to applications.

The product includes 300 external calls specific to C and Microsoft Corp.'s Visual Basic as well as sample code, a forms auditor and an application programming interface for electronic mail, fax and data messaging.

FormFlow Software Developer's Kit costs \$249.

► **Delrina**
(408) 363-2345

Bachman Information Systems, Inc. has announced WindTunnel for SQL Server, performance modeling support for Sybase, Inc.'s SQL Server.

According to the Burlington, Mass., company, WindTunnel for SQL Server provides a modeling method for designing performance into applications early in the development cycle and calculates

resource demand during design.

Pricing begins at \$25,000.

► **Bachman Information Systems**
(617) 273-9003

Pinnacle Publishing, Inc. has announced HighEdit 3.0 for word processor developers.

According to the Kent, Wash., company, HighEdit 3.0 helps developers build word processing functions into Windows applications. It features print preview, data exchange, table object support and documentation.

Other features include multiple levels of undo, access to Windows Common Dialogs for printer selection and data fields with more than one line of data.

HighEdit 3.0 costs \$299.

► **Pinnacle Publishing**
(206) 251-1900

Cadre Technologies, Inc. has announced ObjectTeam Application Factory, a suite of object-oriented development tools.

According to the Providence, R.I., company, the suite lets users automate and simplify component-based application assembly through component design, wiring, testing, assembly and reuse.

The suite consists of ObjectTeam/WireShop, ObjectTeam/ComponentShop and ObjectTeam/DraftShop.

Prices start at \$4,495.

► **Cadre Technologies**
(410) 351-5950

Rational Software Corp. has announced Rational CRC, an object-oriented design tool that supports the class responsibility collaboration (CRC) card technique of object modeling.

According to the Santa Clara, Calif., company, Rational CRC automates the

collection and retrieval of a responsibility-driven design. It is designed to help teams of developers organize, change and document the results of their development.

Rational CRC costs \$495 and runs on Windows.

► **Rational Software**
(408) 496-3600

Logic Works, Inc. has announced BPwin 1.5, a process modeling and design analysis tool.

According to the Princeton, N.J., company, BPwin 1.5 gives business analysts and systems professionals a common language for communication of business processes and functions. It also has viewing options for specifying display fields on a process diagram.

BPwin 1.5 helps users visualize cost, time and frequency to compare and track current and proposed processes.

BPwin 1.5 costs \$2,495.

► **Logic Works**
(609) 252-1177

Product shorts

Hewlett-Packard Co. has introduced Softbench CM, an extension to the Softbench application development environment. The product provides multisite code management capabilities for C, C++, Cobol or Fortran development. Cost: \$995 per license. Hewlett-Packard, Palo Alto, Calif. (415) 857-1501. . . . **Software Interphase, Inc.** has introduced Help Magician Pro 3.0, a help authoring tool for commercial software help writers and on-line documentation specialists. The product allows simultaneous editing, viewing and testing of help files. Cost: \$249. Software Interphase, Foster, R.I. (401) 397-2340.



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Management

By Rochelle Garner

D

r. Brent James remembers the bad old days all too well: misplaced records, duplicated tests, costly treatments. Just ordering an IV was a 20 minute exercise in complex calculations involving a patient's weight, surface mass, metabolism rate and kidney function. Rarely was everything right on the first try.

Times have changed for the Salt Lake City oncologist. Now he and other physicians working at Intermountain Health Care's (IHC) nine hospitals get help from a computer system.

That help is extraordinary. Based on a computerized patient record system that includes every drug prescribed, symptom observed and medical test given in a patient's history, IHC has built a decision-support system that helps physicians deliver the highest quality care at the most effective cost.

Today, for example, IHC's information system takes the guesswork out of IVs — it pulls up each patient's drug sensitivities, lists which bacterium is the likely source of infection and calculates the body's rate of absorption. If more than one drug regimen will do the trick, the system will list cost effectiveness along with efficacy. In the process, each hospital using the computerized patient record system has nearly eliminated adverse drug reactions — and saved \$1 million a year.

"In our organization, we are convinced you control costs by controlling quality," says James, IHC's vice president of medical research. "This is the future of American health care."

Perhaps it is. Certainly the medical com-

munity is roiling with conferences, associations and standards committees, all promoting the widespread adoption of the electronic patient record. What's more, computerized patient record systems such as the one used by IHC provide evidence that quality care and efficient cost need not be mutually exclusive. There's just one problem. These things are damnably difficult to put together.

"The complexity of the project can only be compared with the space program of the 1960s," maintains Peter Waegemann, executive director of the Medical Records Institute in Bethesda, Md. In some ways, this one is even harder.

The space program had NASA to manage its activities; the computerized patient record effort has no one.

Compounding the problem: "There aren't any generally accepted migration paths or milestones on how to do this," Waegemann says.

Small wonder,

then, that the health care industry has achieved precious little beyond a few pilots and small projects. That doesn't mean no one's trying. In fact, the medical industry is expected to spend \$3 trillion to \$5 trillion on computerized patient record systems in the next five years, according to the Medical Records Institute. In those years, the medical IS community will, by its example, blaze a trail for other industries attempting to satisfy the needs of a sophisticated, diverse and demanding user base. It won't be easy.

The reason, put bluntly, is physicians. Impatient of delays and demanding of oth-

Dr. Brent James at Intermountain Health Care gets help from a computerized patient record system



The health care industry is racing to create computerized patient record systems. The goal: to control costs by controlling the quality of care. But are information systems efforts to implement computerized patient record systems...

A MEDICAL moon

ers, nearly all doctors — regardless of specialty — follow a workflow that doesn't include the use of computers. What it does include is that old standby, the tape recorder — into which physicians hurriedly dictate orders

and observations, then hand the tape over to a nurse or assistant to type up.

That will have to change if computerized patient record systems are to work as intended — presenting information on alternative drugs, tests and treatments as the physician places the order. And it is this overarching concern of making the doctor the core user of the computerized patient record that systems developers must somehow, some way, set up.

In the process, it will force a new level in the relationship between users and information systems, making health care professionals an intimate part of the IS effort.

Information, please

Ask anyone to name the major barriers to creating a computerized patient record system, and you'll likely hear the word standards. But not standards of the technical variety. Those have been largely worked out, experts say. Instead, the real area of contention has to do with

QUICK CURES

Executives voted the following technologies as those most likely to experience rapid growth

Clinical data repositories	24%
Networking	17%
Mobile/wireless technologies	13%
EDI technologies	13%

Source: 1995 Healthcare Information and Management Systems Society (HIMSS) and Hewlett-Packard leadership survey of roughly 1,000 participants of the annual HIMSS conference. Top 4 choices listed.

vocabulary. Nearly every term used in the practice of medicine carries with it degrees of meaning that aren't shared outside of individual hospitals, clinics or physician practices.

"One of our clients is putting together a data warehouse so its six separate divisions can work together," says Charles Singer, president of Charles J. Singer & Co. in Wakefield, Mass. "It took them a whole day just to agree on the definition of an end-patient day."

That anecdote highlights the tremendous issues health care facilities face as they try to distribute information to the stakeholders who need it.

Now extrapolate that challenge to its logical conclusion: How is the health care industry supposed to achieve its goals of distributing information to those who need it — with the number of such people increasing as health care providers merge or team up in community health information networks — if you can't agree on even the

"With the shift away from the fee-for-service business model, doctors will need to base their treatments on demonstrated outcomes and results — with the least amount of intervention. Those protocols will squeeze unnecessary costs out of the systems."

G. Ward Kever,
senior vice president of
information services,
Medical Center of Delaware

meaning of the word hypertension?

"To manage care, you need information on what works and what doesn't," says Doris Spanier, manager of electronic data interchange at Blue Shield of California in San Francisco. "That places a value on providing information as much as it does on medicine." Accent, please, on information — not just data.

The distinction is key because to be truly effective, the computerized patient record's massive database comprising every encounter, test result and symptom throughout a patient's history must be placed in a context of medical efficacy. In the practice of medicine, that context takes the form of epidemiologic studies; outcomes research, or how well a particular treatment works; and protocols, which are recommended treatments for each ailment.

"With the shift away from the fee-for-service business model, doctors will need to base their treatments on demonstrated outcomes and results with the least amount of intervention," says G. Ward Kever, senior vice president of information services at the Medical Center of Delaware in Wilmington. "Those protocols will squeeze unnecessary costs out of the systems."

Medical moon shot, page 80

Health care's IS Agenda

Better care, lower costs by integrating institutions and information

BETTER INFORMATION, FASTER

What's driving technology investments in the health care industry? Executives ranked a list of reasons; their top choices follow.

	1ST CHOICE	2ND CHOICE	3RD CHOICE
Move to managed care	32%	19%	12%
Development of clinical data capture and computer-based records	20%	22%	20%
Need for comparative outcomes data	20%	19%	19%
Reform-driven pressure to simplify administrative processes	8%	12%	11%
Move to community health information networks	7%	10%	11%
Desire to provide higher quality patient care	6%	7%	10%

Source: 1995 HIMSS and Hewlett-Packard survey of roughly 1,000 participants of the annual HIMSS conference

shot?



Medical moon shot, continued from page 79

NEEDING A SECOND OPINION

Health care executives disagree on how quickly a network of computerized patient information systems can be implemented nationwide

Will not happen for at least 10 years	40%
Will be a reality by the year 2000	37%
Will happen in 1 to 3 years	12%
Is unrealistic for the foreseeable future	11%

Source: 1995 HIMSS and Hewlett-Packard survey of roughly 1,000 participants of the annual HIMSS conference

Evidence from the few computerized patient record systems in operation supports Keever's view. IHC's LDS Hospital, for example, estimates it is saving \$500,000 annually by preventing grand mal epileptic seizures associated with a high-risk antibiotic. The Regenstrief Institute for Health Care in Indianapolis realized it could save \$3 million a year just by displaying the costs of different drugs, tests and nursing orders. Administrative costs have been cut by \$7 for each of Regenstrief's 12,000 patients. The key is presenting this information to physicians when they order treatments — not after.

"As you look at the cost benefits of these computerized patient record systems, you realize the real benefit comes in at the order-entry point," says Dr. Simon Cohn, an emergency medicine specialist at Kaiser Permanente Health Plan, Inc. in Oakland, Calif.

Cohn pays particular attention to cost/benefit analysis. He's also clinical IS coordinator for Kaiser's \$1 billion computerized patient record project, which will integrate information on the company's 7 million patients in 11 regions in the U.S.

"It's when physicians enter orders that you can actually impact decision-making," Cohn says. And that, it turns out for nearly everyone, is a major hitch.

"One of the biggest challenges is getting physicians to use these systems," Singer says. "They have to feel it's both usable and adds value, as opposed to something they have to contend with."

So far, only Regenstrief reports any real success on this front. The institute enticed physicians not only with useful information but also with speed.

"Our physicians are expected to use the system," says Clement McDonald, co-director of Regenstrief. "It's reasonably easy to use, and our system is very fast. And speed is the only issue with physicians."

But physicians as a group present a unique set of challenges to systems designers.

"What is important to a surgeon is not to a cardiologist," says David Tucker, chief information officer at Hermann Hospital, part of the University of Texas Health Science Center in Houston.

So the solution is for IS to work closely with the users, right? Not exactly. The real way to

solve the problem, say those in the development trenches, is for a major part of the IS staff to be users.

"I continue to practice part time," Cohn says, "because I believe you need ongoing contact with the realities of clinical care to develop these systems in a way that works."

James, who still practices oncology, wholeheartedly agrees. But he takes it even further.

"We've learned that it's important to have an MD/Ph.D. informaticist at each hospital," James says.

But what is an informaticist? It's that person whose skills overlap two professions — that of medicine and computer science, James says. "A good informaticist understands the problems of clinical medicine as he understands the subtleties of systems development."

IHC is putting its doctors where its mouth is. Today, in fact, IHC is spending \$50 million to upgrade the granddaddy of computerized patient record systems to a more modern, open architecture and to distribute that system in all nine hospitals. More important, those informaticists are working hard to push that system into physicians' offices for outpatient care. This

task is not easy.

Consider the complexities. Not only must health care facilities meld nearly 100 applications controlling disparate functions such as laboratories, pharmacies, intensive care units and doctors' offices, they must also coordinate billions of observations about millions of patients. The complexity is magnified when hospitals, health maintenance organizations and doctors' offices attempt to share information.

Compounding the problem: "We don't have vendors in this market that target the full continuum of care," says William Reed, senior vice president and CIO of Quantum Health Resources, Inc. in Indianapolis. "That means most organizations have to become systems integrators — taking this vendor's product and putting it with another's."

In other words, one of the world's most information-intensive industries must work within an immature market that can't yet meet the integration challenge. Small wonder it is having so much trouble building computerized patient record systems. Under the circumstances, the effort seems more akin to sending someone to the red planet than to the moon.

But this is a much more critical mission. Mars can wait before it ever feels the tread of human footsteps — health care cannot. ■

Garner is a freelance writer in San Carlos, Calif.

"The complexity of the project can only be compared with the space program of the 1960s." Compounding the problem: "There aren't any generally accepted migration paths or milestones on how to do this."

Peter Waegemann,
executive director of the
Medical Records Institute

RESPONDING TO CPR

Despite the obstacles to creating computerized patient record systems, several health care organizations have been cited for breathing new life into their integration efforts

EFFORT

ORGANIZATION

Systemwide senior vice president who coordinates quality assurance, human resources, education and outcomes of measurement activities	Sharp Healthcare, San Diego
Continuous quality improvement/ total quality management teams	Fairview Hospital and Health Care System, Minneapolis
Systemwide or uniform budgeting system	Sharp Healthcare Sisters of Providence, Portland, Ore. Sutter Healthcare, Sacramento, Calif.
Systemwide incentive plan that measures system performance	Fairview
Common pay strategy	Sisters of Providence
Consolidation of several hospitals under one management team	Sharp Healthcare
Development of integrated information system	Sharp Healthcare Sutter Healthcare Henry Ford Health System, Detroit
Clear, consistent system priorities	Sharp Healthcare Sutter Healthcare EHS Health Care, Oakbrook, Ill.
University or college system that provides education and/or learning laboratories that also promote the culture and values of the system	UniHealth America, Burbank, Calif. EHS Health Care
Integrated contracting	Sisters of Providence
Physician leadership program on systems	Sharp Healthcare

Source: Professor Stephen Chortell, J. L. Kellogg Graduate School of Management, Health Services Management Program, Northwestern University

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Better care, lower costs by integrating institutions and information

The National Marrow Donor Program's STAR system helps find that one-in-a-million donor

MATCHMAKER, matchmaker

By Kathleen Melymuka

I

n 1992, 11-year-old Kelly in Calgary, Alberta, was diagnosed with leukemia. Her best hope was a bone marrow transplant. But like the majority of patients diagnosed with such potentially fatal diseases, Kelly found that no one in her family matched her tissue type.

Time was of the essence. The sooner a marrow transplant could be performed, the better Kelly's chance of survival. Fortunately for Kelly, she had a lucky STAR watching out for her.

STAR, the Search, Tracking and Registry system, is the engine that runs the National Marrow Donor Program, a congressionally authorized, nonprofit organization based in Minneapolis that maintains the world's largest registry of volunteer bone marrow donors.

Where the health care industry is racing to integrate financial and clinical systems for competitive advantage and wrestling with how to provide fully electronic patient records to improve care, the STAR system already does both on a global scale. But there's no bottom line motive in this case. This is a program driven strictly by quality of care — with life literally in the balance.

Each month, the STAR system supports more than 350 new donor searches, adds 25,000 volunteer donor records and facilitates 60 marrow transplants.

The STAR system automatically directs the search for potential donors from beginning to end. Every night it performs more than half a billion tissue comparisons to automatically update each patient's search. STAR reports potential matches, issues work orders and reports daily on the status of each search. These automated activities let employees at the donor program dedicate more time to patients and donors.

In Kelly's case, STAR's preliminary search found 14 possible matches within 24 hours. STAR then directed and monitored further testing, which narrowed the potential donor pool to three and ultimately to the single best match, a donor from Colorado.

Kelly's marrow transplant was a success. Today, she is a healthy 13-year-old with an excellent prognosis. Her doctor will supply follow-up information for a STAR research database for

five years after the transplant. The research will focus on the most effective treatments for future patients.

The STAR system was built in 1992 to replace an older system that was nearing its peak capacity of 650,000 donor records. Since then, the number of records has topped 1.5 million. The STAR system has also reduced the preliminary search time for a donor match from one week to one day.

To develop the STAR system, the National Marrow Donor Program retained Andersen Consulting in Chicago to work with its staff. The project was particularly challenging because the donor program, which had used a service

Sybase, Inc. relational databases with 125 tables are accessed by more than 200 C-based programs. Because STAR uses an open systems architecture, it can run on any hardware platform, which made it easier for the 300 diverse partners in the donor program network to adopt it. It can also change as needs change, assuring virtually limitless capacity.

The Coordinating Center system is connected electronically with more than 300 donor centers, transplant centers, typing laboratories and blood repositories and uses a variety of hardware platforms in 30 countries. As donor information is entered into any one of these centers or repositories, it is automatically forwarded by MCI Mail to the Coordinating Center. Complete searches can therefore be done in the donor program database, with the STAR system automatically contacting donor center databases as needed.

Identifying the best donor for a marrow transplant is a multiphase process that requires continuing communication among transplant centers, donor centers, labs, blood repositories and the Coordinating Center.

In Kelly's case, a preliminary search compared Kelly's A and B antigens against more than 600,000 volunteer donors (today there are more than 1 million). After flagging 14 potential matches, STAR initiated a formal search. It automatically notified staff in each blood repository that had a potential match and directed them to get permission from the prospective donor. They were then to retrieve a blood sample and ship it to a designated contract lab for more complex DNA compatibility factor testing.

The labs sent blood typing results to the STAR system at the end of each day. STAR kept a history of when and where each sample was shipped and of all results received for Kelly's search.

Based on DNA typing, STAR narrowed the search to three potential donors. The next step, confirmatory typing, required an additional blood sample from each potential donor. STAR notified the three donor centers to inform donors, get samples and have them tested.

Confirmatory typing revealed Kelly's best potential donor. With the best match found, a transplant was scheduled, and STAR continued to monitor progress through marrow harvesting and Kelly's successful transplant. ■

Melymuka is a freelance writer in Duxbury, Mass.

A FIVE-POINTED STAR

The STAR system was designed to support five primary objectives:

- Provide bone marrow matches through a flexible, unlimited-capacity registry database that can conduct searches with complex sets of parameters.
- Automate electronic communication with more than 300 donor centers, transplant centers, typing laboratories and blood repositories using a variety of hardware platforms in 30 countries.
- Increase speed. The sooner a transplant can be performed, the better the chance of patient survival.
- Improve productivity at the National Marrow Donor Program.
- Provide a research tool to study the efficacy of bone marrow transplant therapy.

bureau to manage its old mainframe-based registry, had no IS staff whatsoever.

For the first year of the 18-month development effort, program staff and the Andersen team had to share expertise and develop the system without the help of intermediaries.

"From the beginning, we realized that STAR would be one of the more challenging and rewarding engagements that Andersen Consulting has ever undertaken," says Andersen partner Rieh Monroe.

At the National Marrow Donor Program Coordinating Center, the STAR system uses 30 Sun Microsystems, Inc. IPC workstations as clients on a Unix-based Token Ring network, with a Sun 630 MP and a SPARC10 as servers. Five

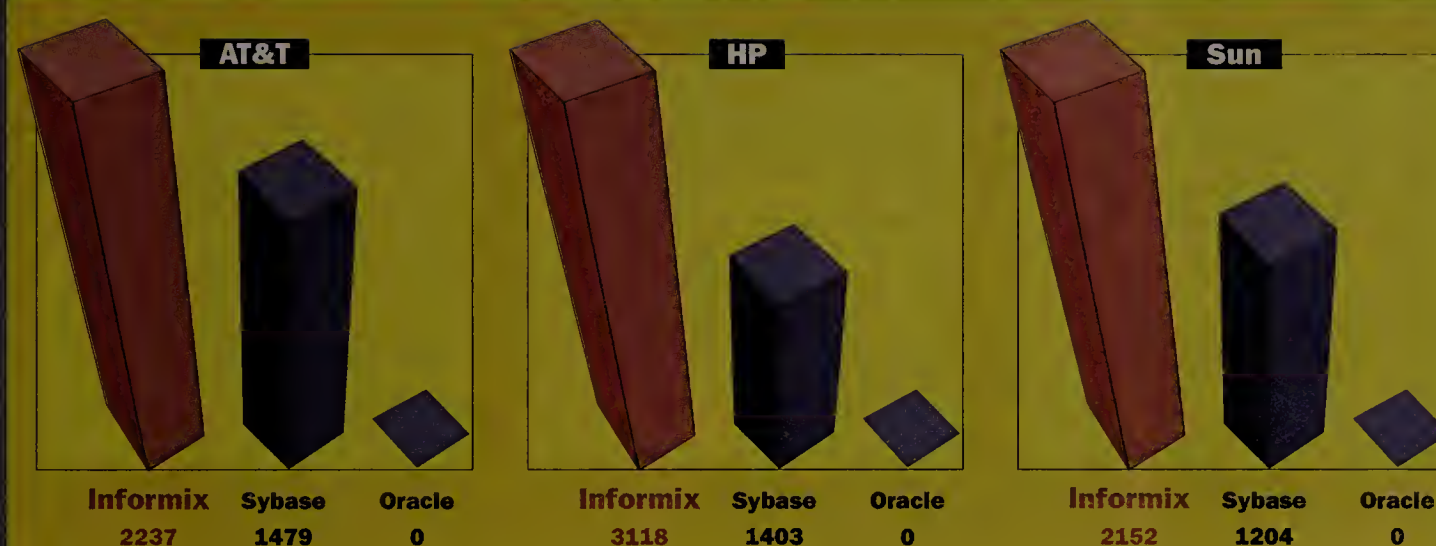
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Executive

Track



Rubbermaid Specialty Products, Inc. in Wooster, Ohio, has announced the promotion of **Maria J. Witt** to vice president of customer service/MIS. Witt has

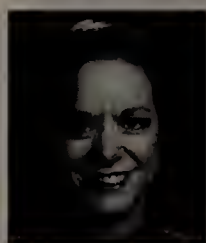
held the position of director of MIS for the past three years, where her primary responsibilities have been planning the strategic direction and application of current and future information systems technologies. In her new position, she will also direct the customer service department. Prior to joining Rubbermaid, Witt held IS management positions at Star Lumber & Supply and Gott Corp.

Northern Southern Corp. in Roanoke, Va., has announced the appointment of **Linda M. Vande Ven** as assistant vice president for planning and development of the information technology department. Based in Roanoke, she supervises employees there and in Atlanta. Prior to

the appointment, Vande Ven worked in computer systems and applications at Bridgestone/Firestone, Inc. in Akron, Ohio, and Chicago; United Stationers in Des Plaines, Ill.; and Eckerd Corp. in Largo, Fla.

VWR Corp. in West Chester, Pa., a major supplier of laboratory supplies and equipment, has announced the appointment of **Gary L. Senese** as vice president of IS and chief information officer. He will be responsible for advancing VWR's strategy of applying information technology to enhance productivity and value throughout the distribution chain. Prior to the appointment, Senese was vice president of MIS in the commercial products division of Rubbermaid, Inc. in Winchester, Va. Prior to that he worked for eight years at General Electric Information Services in Rockville, Md.

The Dress Barn, Inc. in Suffern, N.Y., has announced the appointment of **Edward A. Berndt** as vice president of IS. He will be responsible for overseeing all of the company's IS operations. Prior



to the appointment, Berndt was director of merchandising systems and technical services at Waldenbooks. Prior to that he was an advisory systems engineer at IBM.

Westinghouse Electric Corp. in Pittsburgh has announced the appointment of **Douglas R. Ehmann** to the newly created post of CIO of the Electronic Systems business unit. He will report to Mark D. Jankowski, CIO of Westinghouse. Ehmann will be responsible for development, integration and maintenance of all computer systems that support Electronic Systems' business, engineering and manufacturing functions. He will also oversee the implementation of new financial and human resources information systems. Prior to the appointment, Ehmann headed the IS department for the Cosmetic & Fragrance Products Division of Procter & Gamble Co. in Hunt Valley, Md. He held a variety of marketing and IS management positions at Procter & Gamble.

Bookseller Barnes & Noble, Inc. in New York has announced the appointment of **Richard Kish**, 36, as vice president of information technology. He will oversee MIS at the company. Prior to the appoint-

ment, he was vice president of information technology at Waldenbooks for six years. Previously he was manager of systems and programming at Read's Department Stores, a division of Allied Stores.

Non-Stop Logistics Corp. in San Francisco has announced the appointment of **Sheri Anderson** as CIO. She will be responsible for overseeing the deployment of an IS network at the logistics company.

Prior to the appointment, Anderson was senior vice president in charge of architecture and technology development at Charles Schwab & Co.

Trans Financial Bancorp. in Bowling Green, Ky., has announced that **Vince Berta**, 36, executive vice president of finance, has been given the additional responsibilities of staff and technology. Berta had also held the position of chief financial officer, a post that will now go to former controller Edward R. Matthews.

Federal Mogul Corp. in Southfield, Mich., has announced the appointment of **Fred J. Kerns** as vice president of information technology. He succeeds Thomas J. English, 54, who has left the company.

APRIL 23-29

The Evolution of Object Methods. Chicago, April 24; New York, April 25; Dallas, April 27; San Francisco, April 28 — Focus will be on the unification of object-oriented methods and the state of object methodologies. Contact: Rational Software Corp., Santa Clara, Calif. (408) 496-3600.

Patricia Seybold Group's 1995 Distributed Object Technology Forum. Theme: "Using Objects, Middleware and Workflow to Reinvent the Enterprise." Cambridge, Mass., April 25-28 — Contact: Patricia Seybold Group, Boston, Mass. (617) 826-2424.

MES Roundtable Seminar. San Jose, Calif., April 26-27 — A two-day seminar and exhibition to discuss the benefits of Manufacturing Execution Systems (MES) software for real-time shop floor control. Contact: MES Association, Pittsburgh, Pa. (412) 781-9511.

IS Controllorship for Centralized and Distributed Processing. Colorado Springs, April 26-28 — Topics will include the financial management of IS organizations, such as the nature of IS financial information, financially managing IS as a business, financial planning, cost controls such as chargeback, pricing IS services, activity-based costing, product costing, financial benchmarking, cost/benefit analysis and current IS financials. Contact: Financial Management for Data Processing, Colorado Springs, Colo. (415) 731-3706.

Ninth Annual Atlantic Conference of the Baltimore/Washington Regional Hewlett-Packard Computer User's Group. Rosslyn, Va., April 27-28 — Information on the latest technologies and information management issues for users of all levels. Contact: Phyllis Testerman, Baltimore, Md. (301) 621-5539.

APRIL 30-MAY 6

Client/Server Computing: The Next Generation. Fort Lauderdale, Fla., May 1-3 — Contact: Ashley Pearce, Gartner Group, Inc., Stamford, Conn. (203) 967-6757.

MechanCAD. Chicago, May 1-3 — A new conference for computer-aided design (CAD) professionals in the fields of mechanical design and manufacturing. The focus will be on incorporating new technology and processes into the industrial environment as well as strengthening basic skills in AutoCAD and Autodesk's new ancillary products such as AutoCAD designer and AutoSurf. Contact: Miller Freeman, Inc., San Francisco, Calif. (415) 905-2200.

ISINM '95. Santa Barbara, Calif., May 1-5 — Fourth IFIP IEEE International Symposium on Integrated Network Management (ISINM) Workshop. Contact: Mary Olson, ISINM '95 (805) 569-1222.

MAY 7-13

Navigating IT and Policy Crosscurrents: Strategies for Better Government. Williamsburg, Va., May 7-9 — Keynote speakers: Ellen Brown, procurement counsel, Committee on Reform and Oversight, U.S. House of Representatives; Bill Greenwalt, chief investigator, Senate Committee on Government Affairs, Oversight of Government Subcommittee; Cynthia Kendall, deputy assistant secretary, information management, Department of Defense; Steve LeCompte, vice president, International Data Corp. (IDC) Government Market Services; David Mosebella, senior vice president, Worldwide Research, IDC. Contact: IDC Government Market Services, Falls Church, Va. (703) 876-5055.

Calendar

CHI '95: Association for Computing Machinery's Conference on Human Factors in Computing Systems. Denver, May 7-11 — Contact: Terry Roberts, US West Advanced Technology, Boulder, Colo. (303) 541-6602.

Benchmarking High-Performance Work Teams: Strategic Approaches for Increasing Productivity and Customer Satisfaction. Washington, May 8-10 — Fees: \$895 or \$795 each for three or more people. Contact: Kay James, Clemson University Office of Professional Development, Clemson, S.C. (803) 656-2200.

DECUS '95. Washington, May 9-11 — Contact: Digital Equipment Computer Users Society (DECUS), Shrewsbury, Mass. (800) 332-8755.

IN '95. Fourth IEEE Intelligent Network Workshop. Ottawa, May 9-11 — Contact: Javan Erfanian, Stentor Resource Centre, Inc., Mississauga, Ontario, Canada (905) 615-6486.

Joint Application Development (JAD) Session Leader Workshop. Stamford, Conn., May 9-11 — Focus is on how to manage and facilitate JAD projects. Workshop provides training in facilitation skills and techniques needed for capturing the deliverables for the JAD life cycle, information strategy planning, business area analysis and business system design. Workshop also demonstrates the role of JAD in rapid application development projects. Each participant receives a JAD session leader workshop kit with sample agendas and scripts, a JAD procedures guide and a seminar handbook. Fee: \$1,275. Contact: Pierson Applications Development, Inc., Stamford, Conn. (203) 322-1606.

Electronic Banking '95: Develop a Strategic Vision to Maximize Your Market Share and Profit Poten-

tial on the Electronic Banking Superhighway. Washington, May 11-12 — Contact: Conference Administrator Institute, New York, N.Y. (212) 661-8740.

The Electronics Industries Association's Consumer Electronics Group. Philadelphia, May 11-13 — Contact: Jonathan Thompson, Electronic Industries Association, Washington, D.C. (202) 457-8728.

MAY 14-20

Interactive '95. Anaheim, Calif., May 14-17 — Topics: "Design Methodology and Resources," "The State of the Art of Multimedia Technology," "Research and Implementation Strategies." Contact: Ziff Institute, Medford, Mass. (800) 348-7246.

Micro Focus User 1995 Conference. Philadelphia, May 15-19 — Contact: Micro Focus User Conference, Palo Alto, Calif. (415) 496-7356.

Developing An Outsourcing Strategy: Success Factors for IT and Business Sourcing. Monterey, Calif. May 16-17 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

SEND ANNOUNCEMENTS TO:

David Weldon, Associate Editor/Management, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931.



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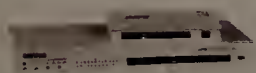
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The CW Guide to Document Management

Going with the flow

Document management products bring order to the chaos of electronic and paper files that dominate the workflow of most companies

WHAT THIS GUIDE IS ABOUT:

Document management, a set of services that help users keep track of stored electronic documents, can reduce the time users spend creating and seeking information. But IS must be prepared to combine ill-assorted offerings from imaging/workflow, publishing systems and database vendors to develop a complete document management system. Users tell their tales to freelance writer Lynda Radosevich.

MAJOR STORY:

People have been trying to manage documents and workflow for years. Finally, software tools are emerging to create a unified document management vision. These tools can be categorized into file and library managers as well as compound document managers. Carl Frappaolo, executive vice president of Delphi Consulting Group, Inc., explains the differences and benefits of the leading products. **PAGE 92**

KEY DATA:

Users reveal their satisfaction with PC Docs, Inc.'s PC Docs Open, Saros Corp.'s Saros Document Manager, Interleaf, Inc.'s Intellecte and Documentum, Inc.'s Enterprise Document Management System in our Buyers' Satisfaction Scorecard and Firing Line evaluations. **PAGE 97**

BY LYND A RADOSEVICH

Any way you slice it, managing documents is a big job. Whether you are a pharmaceutical company producing volumes of documentation to comply with federal regulations, a law firm tracking case records or an advertising group creating a new market proposal, tapping the intellectual resources in documents is key to getting products out on time and keeping customers happy.

Document management software can help. Loosely defined, it is a set of services that help users keep track of stored electronic documents. Industry sources estimate an average worker spends half a day working with docu-

ments. These sources say electronic management systems can reduce the time it takes to create and seek documents and therefore reduce costs, increase productivity, speed time to market and leverage professional expertise.

But products that completely solve an organization's document problems are rare. Users may find themselves bridging ill-assorted offerings from imaging/workflow vendors, publishing systems vendors and database vendors.

There are three basic types of document management systems: file managers, library managers and compound document managers (see Product Overview, page 92). Within each of these approaches, users must determine the extent of the document collection to be managed. Document management systems support desktop, group and enterprisewide installations. The primary difference between group- and enterprise-oriented products is the under-

lying structure and methods of control.

A 1994 International Data Corp. study of 300 sites found that integrating heterogeneous applications is one of the biggest challenges that companies face when installing document management systems. Other roadblocks include getting people to use the system, changing dependence on paper printouts, dealing with historical documents and improving general business processes before slapping in a document management system.

Until plug-and-play document management arrives, many users are forging ahead with their own strategies to address document management processes such as capture and creation, storage and routing as well as retrieval and manipulation.

Radosevich is a freelance writer in Belmont, Mass.
—Guide continues on page 88

Creation

DOCUMENT CREATION

Creating documents is no longer just a matter of using Novell, Inc.'s WordPerfect or Microsoft Corp.'s Word. With copious new sources of document material — electronic mail, scanned images, faxes, spreadsheets, graphics and computer-aided design drawings — the name of the game is linking.

Word processors are fine for most jobs,

but creating huge, complex documents for highly regulated items such as airplanes and new drugs requires more structured techniques. Specialized document authoring software from Interleaf, Inc., Frame Technology Corp. and XSoft can track multiple authors and information sources. Rules checkers ensure that authors include necessary pieces, such as mandated warning statements. The software also treats information sources as objects stored in a document database, which means the information can be reused in subsequent documents and updates to the source

material are reflected in the linked documents.

For Cell Therapeutics, Inc., a Seattle-based pharmaceutical company, these features let professionals spend more time producing oncology remedies and less time publishing specifications, according to Mike Arnold, vice president of information technology.

"While we do mostly research and development, regulatory filing is a key business process," Arnold says, explaining that a typical new drug application by the Food and Drug Administration runs between 50,000 and 250,000 pages.

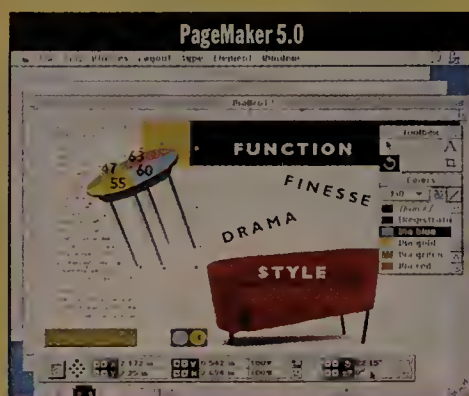
Interleaf's Intellect document management system helps Cell Therapeutics integrate information from various

sources, including photographs, graphics and Word, and route the new compound documents through review cycles. The original laboratory information and raw experimentation statistics are centrally stored and managed and updated regularly in various pharmaceutical documents, Arnold says.

While the system is key, Arnold says integrating the source material into the Interleaf system isn't as easy as it might be. But he says it is easier to use the Standard Generalized Markup Language (SGML), a decade-old standard format for tagging the components in a complex document.

However, SGML is gaining favor among government agencies and industries. Al-

High-end document creation (desktop publishing) packages



Adobe Systems, Inc.
Seattle
(800) 776-5888
Sugg. list price: \$895

PROS

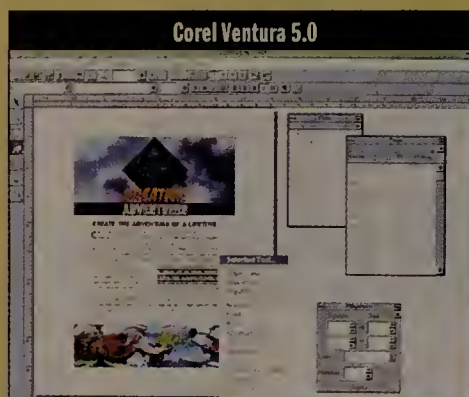
Adds more flexibility and expansion options to a sturdy and friendly foundation. (*Computer Shopper*, January 1995)

Version 5.0 is a major advancement. It includes improved color capabilities, cross-platform support and tools for preparing documents. (*Windows Sources*, July 1994)

CONS

You still can't drag and drop text in PageMaker's layout view or its story editor, which is a rudimentary word processor. (*Computer Shopper*, August 1994)

PageMaker 5.0 still doesn't offer the same precision and flexibility as QuarkXpress in page layout, typography and color management. (*Windows Sources*, July 1994)



Corel Corp.
Ottawa, Ontario
(800) 836-3729
Sugg. list price: \$445

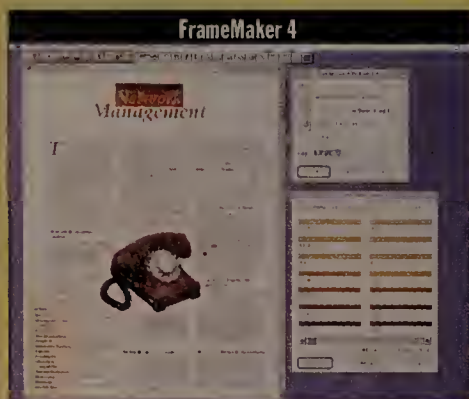
PROS

Ventura is a born-again publishing tool. Its revamped interface ports plenty of well-designed CorelDraw-style features. (*PC World*, December 1994)

Features redesigned interface, OLE 2.0 support, improved text editing and text wrapping. (*PC Week*, October 1994)

CONS

Corel Ventura 5.0 was delayed for five months after beta testers reported that it was not ready for release. (*Computer Reseller News*, October 1994)



Frame Technology Corp.
San Jose, Calif.
(800) 843-7263
Sugg. list price: \$895

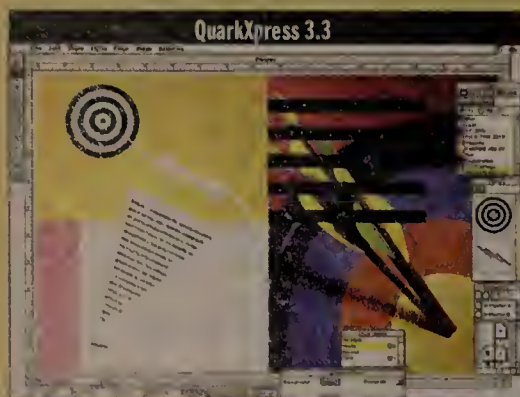
PROS

Text-intensive publishing in a mixed corporate environment is FrameMaker's raison d'être. In addition to Windows, the program runs on Macintosh, Power Macintosh, Sun Solaris, SGI, HP and IBM RS/6000 systems. (*Computer Shopper*, August 1994)

CONS

FrameMaker is button happy with a plethora of tiny icons, but there is no prompt that provides a clue to their functions as you point at them. (*Computer Shopper*, August 1994)

The package doesn't offer the extensibility of QuarkXpress and PageMaker, but it provides flexibility not found in any rival. (*Windows Sources*, July 1994)



Quark, Inc.
Denver
(800) 788-7835
Sugg. list price: \$895

PROS

Few programs can match its on-the-fly page layout and graphics design features. Its precision typography comes closest to emulating the physical world of page layout. (*Computer Shopper*, August 1994)

QuarkXpress offers excellent cross-platform support between Windows and Macintosh versions. (*Windows Sources*, July 1994)

CONS

QuarkXpress isn't the easiest program to learn but once learned, it's easy to use. (*PC Computing*, December 1994)

You have to plod through major text revisions within the layout — or continuously port articles in and out of your word processor. (*Computer Shopper*, August 1994)

so adding to SGML's emerging popularity is Hypertext Markup Language (HTML), which is used to create links on the World-Wide Web. HTML is a subset of SGML, so in theory, authoring documents in SGML makes them easier to connect to the Web.

Consequently, many vendors of document authoring software are building SGML converters into their products in an attempt to make the arcane standard easier to use. For instance, Microsoft began selling SGML Author for Word last month. WordPerfect, the Novell Applications Group, offers Intellitag, an SGML converter for DOS and Unix versions of WordPerfect, and said a Windows version will ship by midyear. Still, critics point out that these low-end packages lack the rules-checking features found in the more specialized packages.

—Lynda Radosevich

Storage

DOCUMENT STORAGE AND ROUTING

Creating documents is the easy part, information systems managers say. Storing, tracking, controlling access and routing is where the guts of document management lie.

"Our end product often is paper," says Jeffrey Brandt, chief information officer at Porter, Wright, Morris & Arthur, a law firm in Columbus, Ohio. "Without an effective way to organize and access those documents, it's like putting them in a trash can."

To avoid such trashing, the firm uses a system from PC Docs, Inc. that lets 300 professionals in Ohio, Washington and Florida categorize, save, search and retrieve word processing documents as well as scanned images, according to Brandt.

Like Porter, Wright, many organizations use document management to support internal ad hoc workgroups using products such as PC Docs, Saros Corp.'s Mezzanine and Novell, Inc.'s Soft Solutions.

Conversely, companies supporting more structured, production-level processes such as airplane manual production or insurance claims processing lean toward higher-end systems from companies such as Documentum, Inc., FileNet

Corp. and ViewStar Corp.

However, experts agree that the product distinctions are beginning to blur as office systems start to support more robust server platforms and production systems become more open and easier to use.

Either way, users say they are looking for a core set of document management ser-

vices. As a rule, users can search document text or profile information across networks. And when somebody checks out a document, the system keeps track of it. Production system users can expect built-in image support, while office system customers can use add-on imaging software from Watermark Software, Inc. or Imagery Software, Inc.

Likewise, Documentum has built-in routing and workflow management, but others support workflow through electronic-mail systems or third-party workflow vendors such as Action Technologies, Inc.

Buckle up

Security functions are another popular benefit that let systems managers set authorization rights. The California State Assembly in Sacramento finds Saros Mezzanine's security features very valuable, says systems analyst John Hutchinson. Legislators use Mezzanine to share, analyze and append legislation. The security mechanisms can allow access to small groups or, say, to all the Democrats.

"But not the Republicans. Obviously, in a political environment, you don't want to give access to wrong people, so security is very important," Hutchinson says.

Overall design

Other organizations see document management as one component of an overall computing architecture. Most systems use databases such as Oracle Corp.'s Oracle or Sybase, Inc.'s Sybase and SQL to store indexing, tracking and security information. Users are currently interested in linking database information with document management to build more comprehensive office systems.

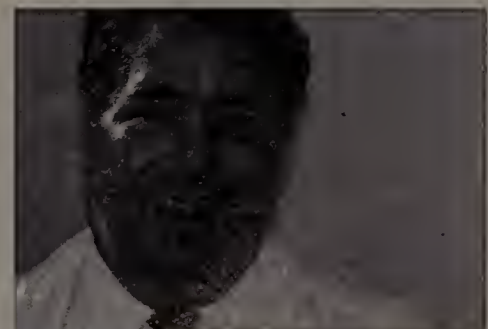
"We'd like to pull in SQL-based accounting information and use Saros for file transfer, version control and home access," says Frank Gillman, director of operations at Los Angeles-based law firm Nossaman, Guthner, Knox & Elliott. Doing so should not be difficult because Saros' Mezzanine uses an SQL database and supports standard SQL queries, he adds.

—Lynda Radosevich



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To avoid such trashing, the firm is using a system from PC Docs to let 300 professionals in Ohio, Washington and Florida categorize, save, search and retrieve word processing documents and scanned images.



Mike Arnold, vice president of information technology at Cell Therapeutics in Seattle, relies on Interleaf's Intellect document management system to create and route compound documents through Food and Drug Administration reviews. While the system is key, Arnold says integrating the source material into the Interleaf system isn't as easy as it could be.

Retrieval

DOCUMENT RETRIEVAL AND MANIPULATION

Once a company produces a document, it may want to make its information more broadly available. Firms ordinarily print the results and distribute hard copies, but other options, including fax broadcast and electronic distribution, are steadily gaining ground. These fall into the category of document retrieval and manipulation.

For instance, some organizations intent on saving paper costs use "viewers" to published documents. Viewers such as Adobe Systems, Inc.'s Acrobat, Electronic Book Technologies, Inc.'s Dyntax and Interleaf, Inc.'s WorldView let recipients see, and print if necessary, all components of compound documents. The recipients don't have to load the applications used to create the components. This method is garnering significant cost savings for The Equitable Life Assurance Society, according to Greg Tyson,

vice president of technical architecture.

The organization creates sales and marketing information using multiple applications, converts them into Adobe's

portable document format and stores them on a server. Agents in the field use Acrobat to search and retrieve the documents they need. The savings are found in reduced shipping, storage, postage and destruction costs of paper-based information, Tyson says.

Likewise, the state of Wisconsin's legislature uses Acrobat to draft, review and publish legislation. Authors use Interleaf to draft legislation, Documentum to manage, route and control access to the documents and Acrobat to view them. For outside publication, the state prints the Acrobat formatted documents as needed to a Xerox DocuTech production printer.

Integration key

The system is open and flexible, but mixing all the parts wasn't a piece of cake, according to Michael Castle, an Andersen Consulting senior manager in

charge of the project. "An integrated package would have been ideal," he says, adding that he hopes the vendors effort will produce a standard set of application programming interfaces (API) for building complete document management systems.

The good news is that vendors are indeed working on interoperability issues. Examples include the Shamrock Group's API for linking different document management systems and the Xerox Corp./Novell, Inc. Document Enabled Networking framework for linking Novell's NetWare and document management services. On the desktop, Microsoft Corp.'s Object Linking and Embedding links compound document components in Windows, and Component Integration Laboratories' Open Document Management API is attempting to do the same across multiple operating systems.

—Lynda Radosevich

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How to evaluate document management:

A field of many players and much confusion

BY CARL FRAPPAOLO

Put a piece of paper in a file folder and you are performing document management, right? Wrong!

The changing nature of the document — from paper files to a dynamic electronic resource — and the recent focus on document-based business re-engineering are forcing organizations to rethink their document management needs. Once a simple and straightforward concept, document management has become complex and diverse.

Document management means many things to many people. Indeed, why isn't a manila folder a form of document management? To be honest, in the broadest definition it is. But when we speak of document management in reference to an on-line document system, we need a more focused definition. Redundant functionality among various technologies such as workflow, text retrieval and imaging creates further confusion, especially when they are integrated into various document management systems.

But these technologies are not in and of themselves document management. Some analysts, vendors and users foster this confusion by failing to clearly differentiate between

these markets. That is why revenue projections for the document management industry range from hundreds of millions of dollars to billions. If you are to keep your sanity as you investigate this marketplace, you must put some boundaries on the technology.

What is it?

Minimally, a document management system must provide a means to store, easily locate and retrieve, and exercise some degree of control over document-based information throughout the document's life cycle.

Even with this finite definition of document management, there is still room for confusion. More than one approach to document management exists within this definition.

Rather than worry about a definition, your job as an information systems professional is to determine the level of control necessary, the appropriate approach to retrieval and the type of documents you are tracking. Determining these variables will frame the type of document management system your applications require.

The three basic types of document management systems are: file managers, library managers and compound document managers (see stories, page 93). These categories can again be divided into desktop, workgroup and enterprise segments.

Group-oriented products are directed to the end user. They are typically shrink-wrapped products that can manage any number of documents in a single LAN environment. Group-oriented products do not provide sophisticated commit protocols enabling rollback and recovery of documents.

Enterprise-oriented products are targeted at the IS group and are typically architected as a set of tools to build document management solutions across any number of LANs and WANs. Enterprise-oriented solutions provide tighter control over systems configuration and document commit protocols.

Beyond basic product categories and architectures, evaluation should focus on more subliminal features of the product. These include platform availability, supported file types, integrated databases, support for document management

standards, integrated text retrieval, integrated workflow, specific support for engineering applications and application programming interface tool sets.

Keep some general guidelines in mind when investing in a document management system. First, look for vendors that are making headway or are minimally stating a direction toward the enterprise compound document management approach. Bet on vendors that are driving and supporting the prevailing document management standards. Shy away from file managers as a source of document management. These products are valid as file managers but do not offer true document management functionality. Watch firms such as Microsoft Corp., which has stated plans to consume this level of functionality within operating systems such as Cairo.

As these object-oriented document-aware environments emerge, the onus will be on document management vendors to stay one step ahead and differentiate themselves by providing added benefits. Vendors that provide intelligent links, electronic signatures, electronic watermarks or authenticating and similar functions should stay above the noise.

Finally, consider the fact that document management is quickly being recognized as a basic requirement for virtually any document-intensive application. Integration between document management and other document-based technologies such as workflow, text retrieval and imaging is inevitable.

Frappaolo is executive vice president of research at Delphi Consulting Group, Inc. in Boston.

HOT PRODUCTS

Although some vendors such as PC Docs, Inc., Saros Corp. and Interleaf, Inc. (see Buyers' Satisfaction Scorecard, page 97) have established themselves as early leaders in the document management arena, competitors continue to upgrade and announce products that stretch the capabilities of current offerings.

Softsolutions

Market leader Softsolutions, which Novell, Inc. now owns, is due for a major upgrade from Version 4.0 to 4.1 in the near future. Priced at \$495 per server and \$295 per user, Version 4.0 includes an Activity Log that tracks past activity on a document, expands the number of formats accessible via the document viewer to about 100 and comes with Object Linking and Embedding 2.0 and Open Database Connectivity in the Windows version.

Other features include a \$1,995 add-on Server Enhancement Module that speeds file access to Novell's NetWare file servers and manages access to multiple document databases; and an interface — Document Desktop — which improves the ease of use of the interface by using icons to represent documents and folders for document files.

Analysts say the next release, 4.1, will take advantage of the array of Novell and WordPerfect, the Novell Applications Group's products in the messaging, scheduling and groupware arenas to further integrate SoftSolutions with network and desktop functions.

Visual Recall

Xerox Corp.'s XSoft division is creating new definitions of document management techniques with its Visual Recall product. The product

features a graphical user interface based on Xerox's Palo Alto, Calif., Research Center's multidimensional modeling techniques to show relationships between documents.

Priced at \$395, Visual Recall 1.01 provides a Tree View that displays document search results based on relationships between file attributes in three dimensions. A Grid View displays documents in relation to one another over a period of time indicating when tasks are accomplished.

The product also features a full-text database engine that allows users to create searchable full-text indexes of any file type.

XSoft also recently announced Astoria, an object-oriented database that provides text-retrieval, revision-control and application development tools for multiple document types, including Standard Generalized Markup Language.

Acrobat Capture

One of the most popular products for exchanging electronic documents when users have different formats and applications is Adobe Systems, Inc.'s Acrobat 2.0. Competing with WordPerfect's Envoy, No Hands Software's Common Ground and Farallon's Replica, Acrobat is now being extended to encompass paper documents.

Soon to be announced, Acrobat Capture converts paper documents into electronic versions using a single Portable Document Format (PDF). Full-text searching, security, annotation, hypertext linking and the integration of multiple file types are facilitated by PDF.



XSoft's Visual Recall offers a three-dimensional Tree View of documents and files using technology from Xerox's Palo Alto Research Center

Document Manager

Saros announced enhancements to its market-leading document management front end and database. The front end — Document Manager — will be upgraded from 1.10 to 1.12. It features the first phase of Road Warrior, a project aimed at allowing users to work with documents on the laptop and have their information synchronized and recognized by the desktop/server when the laptop is connected to the network. Phase two will place a stand-alone version of Document Manager and the Mezzanine database on the laptop.

The company also added foreign language support and a number of platforms for Document Manager and Mezzanine.

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 - IS/MIS/DP Management
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 - 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin. Services
 - 23. Dir./Mgr. Sys. Development, Sys. Architecture
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 - 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

- 51. Sales & Mktg. Management
 - 70. Medical, Legal, Accounting Management
- OTHER PROFESSIONAL MANAGEMENT**
- 80. Information Centers/Libraries, Educators, Journalists, Students
 - 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products

☐ Yes ☐ No

Networking Products

☐ Yes ☐ No

E4D5-3



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- 80. Information Centers/Libraries, Educators, Journalists, Students
 - 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

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- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products

☐ Yes ☐ No

Networking Products

☐ Yes ☐ No

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File Managers

At the low end of document control and retrieval functionality are the file managers. These products are typically tied to a single file type—predominantly document images.

File managers provide two ways to organize documents: profiles or cabinets. Profiles are quasi-databases that allow a limited number of index values to be associated with each document (i.e., author name, date, title). Cabinets are an icon-based metaphor for the traditional file cabinet/drawer/file folder approach to document organization.

Retrieval functionality is based on the storage/indexing approach of the prod-

uct. There are some exceptions, such as Caere Corp.'s PageKeeper and MindWorks Corp.'s The Knowledge Builder, which provide a full-text query approach to retrieval. But despite this higher retrieval capability, these products are still considered file managers due to their lack of a sophisticated security and life cycle management feature.

Because file managers' roots are in document imaging, they tend to treat all files as images and thus do not typically provide revision control, check-in/check-out and read/write protection. Other products in this category range from Keyfile Corp.'s Keyfile at the group level to IBM's VisualInformation and Wang Laboratories, Inc.'s Open/Image at the enterprise level.

—Carl Frappaolo

Library Managers

Library managers, which provide a high level of control over documents, are not tied to a single file type. The trend among these products is to support virtually any file type in its native application—images, word processing systems, desktop publishing systems, spreadsheets, computer-aided design files, etc.

Retrieval is typically provided in two methods: indexes that are user-defined in a full-function database (most typically a third-party relational database such as Oracle or Sybase) and through a fully integrated full-text query engine.

Sophisticated security schemes, revision tracking and control, document

check-in/check-out and usage audit trails are all standard features of these products. Because library management products focus on multiuser access, none function at the desktop level, although there is nothing to stop a user from implementing a single-user installation.

At the group level, leading products include Novell, Inc.'s SoftSolutions, Salix Systems' DocStore and Saros Corp.'s Mezzanine. Enterprise-level library managers include XSoft's Virtual Document Library, IBM's Visual Document Library, Novasoft Systems, Inc.'s NovaManage, PC Docs, Inc.'s PC Docs Open, Sonoran Technologies' Tapestry and Mobius Management Systems, Inc.'s Document Direct.

—Carl Frappaolo

Compound Document Managers

Compound document managers are at the cutting edge of functionality. While these products provide similar functionality to that of library managers, they take a different approach to document definition. Following current trends in document architectures and authoring tools, compound document managers treat the document as a virtual and dynamic resource.

Under this approach, the document is not necessarily a single source of information, but rather a collection of pointers to various and diverse collections of information. For example, a document may embody several separate pieces of text, a linked spreadsheet and an embedded scanned image.

The compound document manager tracks and controls each component of the compound document, providing greater flexibility and levels of control than its library manager counterparts. Each component is revision controlled, audited and protected. In this way, the re-

lationships among documents based on common components can be tracked. The distributed processing/tracking should be provided not just for the document indexes but for the components as well.

The challenge to vendors in this category is to provide this control across an entire enterprise and keep track of these relationships so that a change to a component in one document may or may not be reflected in its use in another document. Roll-back and recovery and audit trails are provided at the component level, maintaining each document's integrity.

This approach to document management is leading toward support for the intelligent document. Provided in controlled environments by vendors such as InterLeaf, Inc. and Uniplex Integration Systems, Inc., the intelligent document tracks the relationships among document components. Thus, a change in one component may cause an automatic change to another. Minimally, the intelligent document should warn the author when a document is accessed, indicating that components are potentially out of sync.

The availability of full-function intelligent tracking across the enterprise is clearly a future direction, but not a current feature.

—Carl Frappaolo

KEY DOCUMENT MANAGEMENT PRODUCT TYPES

File managers

These products are at the low end of document control and retrieval functionality and are typically tied to a single file type. They organize documents as profiles or cabinets. Profiles are quasi-databases that allow a limited number of index values to be associated with each document. Cabinets are icon-based symbols for the traditional file cabinet, drawer or file folder approach.

FOR THE DESKTOP

PageKeeper
Caere Corp.
Los Gatos, Calif.
(408) 395-5148

The Knowledge Builder
MindWorks Corp.
Sunnyvale, Calif.
(408) 730-2100

FOR GROUPS OF USERS

AskSam
AskSam Systems
Perry, Fla.
(800) 327-5726

Keyfile
Keyfile Corp.
Nashua, N.H.
(603) 883-3800

Power Office
EZPower Systems, Inc.
Philadelphia, Pa.
(215) 496-1700

Precise/Review
Precise Systems Corp.
Edmonton, Alberta
(403) 421-8181

FOR THE ENTERPRISE

IMS
FileNet Corp.
Cosa Mesa, Calif.
(714) 966-4300

Open/Image
Wang Laboratories, Inc.
Lowell, Mass.
(508) 459-5000

VisualInfo
IBM
Somers, N.Y.
(914) 766-1623

Compound document managers

These products treat the document as a virtual and dynamic resource. The document is a collection of pointers to various and diverse collections of information. For example, a document may embody several separate bodies of text, a linked spreadsheet and an embedded scanned image. The compound document manager tracks and controls each component of the compound document.

FOR GROUPS OF USERS

Astoria
XSoft (a division of
Xerox Corp.)
Palo Alto, Calif.
(415) 813-7085

Basisplus
Information Dimensions,
Inc.
Dublin, Ohio
(800) 328-2648

Odesta ODMS
Odesta Systems Corp.
Northbrook, Ill.
(708) 498-5615

FOR THE ENTERPRISE

Documentum EDMS
Documentum, Inc.
Pleasanton, Calif.
(510) 463-6800

Foldir
Quality Information
Systems
Los Angeles, Calif.
(310) 287-0728

Intellect
Interleaf, Inc.
Waltham, Mass.
(617) 290-0710

OnGo DMS
Uniplex Software Corp.
Folsom, Calif.
(916) 985-3617

PDM
Xyvision, Inc.
Wakefield, Mass.
(617) 245-4100

Productivity Edge
PRC, Inc.
Reston, Va.
(800) 441-0670

Library managers

In general, these products support virtually any file type in its native application. Retrieval is typically via indexes, which are user-defined in a full-function database, or through a fully integrated full-text query engine. Library managers provide a high level of control over the documents.

FOR GROUPS OF USERS

DCS Powernet
Mystic Management
Systems
Mystic, Conn.
(203) 536-3107

DocStore
Salix Systems
Schiller Park, Ill.
(708) 678-5699

Document Manager
Cimage Corp.
Ann Arbor, Mich.
(313) 761-6550

File Magic Plus
Westbrook Technologies,
Inc.
Westbrook, Conn.
(800) 562-1511

FYI
Identitech, Inc.
Melbourne, Fla.
(407) 951-9503

SoftSolutions
Novell, Inc.
Groupware Division
Orem, Utah
(801) 226-6000

FOR THE ENTERPRISE

Cadexnet
Database Applications,
Inc.
Redwood City, Calif.
(415) 593-3477

CMS
Workgroup Technology
Corp.
Lexington, Mass.
(617) 674-2000

Document Direct
Mobius Management
Systems, Inc.
Chicago, Ill.
(312) 466-4660

Formtek:TDM
Formtek, Inc.
Sunnyvale, Calif.

(408) 756-2001
NovaManage
Novasoft Systems, Inc.
Burlington, Mass.
(617) 221-0300

PC Docs Open
PC Docs, Inc.
Tallahassee, Fla.
(904) 942-3627

Saros Document
Manager
Saros Corp.
Bellevue, Wash.
(206) 646-1066

Sherpa/Pims
Sherpa Corp.
San Jose, Calif.
(408) 433-0455

Tapestry
Sonoran Technologies
Scottsdale, Ariz.
(602) 946-2925

Visual Document Library
IBM
Somers, N.Y.
(914) 766-1623

Visual Recall
XSoft (a division of Xerox
Corp.)
Palo Alto, Calif.
(415) 813-7085

Worldox
World Software Corp.
Ridgewood, N.J.
(800) 962-6360

Documentum's use slowed by complexity

BY KEVIN BURDEN

Complete document management — including object-oriented and workflow power — is what Documentum, Inc.'s Documentum promises. It is one of the most functionally robust solutions among the high-end sets of client/server tools available.

There are obvious advantages to using a feature-laden product of Documentum's caliber, but the downside is overhead. Documentum demands a sizable infrastructure, and the learning curve can be steep.

Getting users to just understand the technology and processes of automated document management is itself an onerous task. Throwing the gamut of document management features at them doesn't help.

"Getting our users to understand compound documents and workflow concepts has been a real hurdle for us," said Bob O'Leary, applications manager at Genetics Institute, Inc. in Cambridge, Mass. "Documentum has all the capabilities we would ever need, except somebody jumping out of the computer to teach people how to use it."

The user companies interviewed for this evaluation included a utility, a biopharmaceutical company, an aerospace firm and a manufacturer. The format was developed with help from Howard Rubin and Associates and Technology Investment Strategies.

Document development

Because documents are typically created by external applications opened within Documentum or imported afterward, Documentum's integration with external programs is a critical feature.

Aerospace firm: "We have not had a single problem creating or checking in any documents developed with our suite of Microsoft Corp. applications."

But Novell, Inc.'s WordPerfect created problems for two evaluators.

Biopharmaceutical company: "WordPerfect does not launch properly in Documentum so that you can start with an empty document. We can import WordPerfect documents without problems, but creating docs not work well."

Utility: "We have not been able to use the [Dynamic Data Exchange] function of WordPerfect."

Workflow capabilities

Although it can manage documents with workflow capabilities, Documentum does not rival specific workflow applications. Evaluators said the workflow engine gives Documentum tremendous potential, but Documentum's table-driven interface makes setup difficult and the clients less intuitive.

Aerospace firm: "This is not an out-of-

Documentum

Documentum, Inc.
Pleasanton, Calif.
(510) 463-6800

Scores represent the average ratings of four evaluators and are based on a 1-to-10 scale where 10 represents extremely satisfied and 1 represents not satisfied at all. Average score is the mean of the category ratings.

Average score 8.0

Document development 7.5

Clean integration with Microsoft applications, but WordPerfect packages posed problems (see vendor response).

Workflow capabilities 7.0

Powerful workflow engine stores a lot of potential, but a better interface would make it more usable (see vendor response).

Handling of compound documents 8.3

One of Documentum's best features. The user interface was dramatically improved in Version 2.0.

Library capabilities 9.5

Flawless operation of all common and not-so-common functions.

Usability 8.0

The ability to shield users from specific functions keeps Documentum from becoming too overwhelming.

Service and support 7.8

Mixed reviews. Evaluators saw Documentum at its best and worst.

The screenshot shows a 'Route Slip' window titled 'ROUTING - REQUEST'. It includes a 'Please' section with checkboxes for READ, HANDLE, APPROVE, FORWARD, RETURN, KEEP OR DISCARD, and REVIEW WITH ME. There are also 'Priority' radio buttons for Urgent, Important, and FYI. A 'Route To:' field lists users: Jerry, Sally, and Jim. An 'Instructions:' box contains the text 'Please read and route to me your comments.' At the bottom, it shows 'Route To: Attached: 1995 Budget Proposal', 'From: Tom', and 'Date: February 1, 1994'. Buttons for Start, Add, Remove, Cancel, and Help are visible.

Vendor response

Root versions

A document's root version cannot be deleted. Users can make a recent version the root and delete the others to free space, but Documentum holds two versions for every document.

WordPerfect problems

The most common reasons why WordPerfect will not launch are insufficient memory — it requires a minimum of 8M bytes of RAM — and incorrect path.

Workflow ease

Documentum's intent is to provide a graphical processing mapping tool to complement the tasksheet workflow capability in a later version.

the-box workflow solution. You can integrate it with other project managers if you're willing to do the coding. We've folded in Microsoft Project, which gives us the drag-and-drop interface we need."

Biopharmaceutical firm: "Our users have not taken to the idea of workflow. Things are changing very slowly."

Compound documents

The promise of compound document support on the server through the Virtual Document Manager gives Documentum a key advantage over other products, according to the evaluators. Users were pleased with the file manager-like interface, which is new to Version 2.0, and its ability to search, route and create relationships among a document's different components. But like workflow, the main problem pointed to user issues.



Aerospace firm: "Creating relationships is very easy from an API level. Working with compound documents in general has been dramatically improved in Version 2.0 because it adds an interface. But the concept of compound documents is posing problems. This is a paradigm shift for our people."

Library capabilities

Workflow and virtual documents catch the eye, but Documentum's library services are the trump card, according to one evaluator. Basic functions such as check-in and check-out, audit trails and search features are handled masterfully, but its competence with the not-so-common functions intrigued evaluators the most.

Aerospace firm: "Documentum handles some things elegantly that most other systems haven't even started to talk

about yet — like relationship objects where the link between two objects is an object itself. It opens some interesting possibilities."

Usability

Due to substantial interface improvements in Version 2.0, evaluators said Documentum is easy to use if you are familiar with it. Getting users to embrace the workflow processes and concepts will take more time, but none faulted Documentum for the learning curve.

Biopharmaceutical company: "Version 1.0 had an enormous proliferation of windows on the screen. Our people were getting lost all the time. Version 2.0, with its concept of file cabinets and folders, is a tremendous improvement."

Burden is *Computerworld's* senior researcher, Scorecard/Firing Line.

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PC Docs: Easier and scalable

PC Docs Open



PC Docs Open users set the basics as the benchmarks — retrieval, searching and support. (These categories are the six most important buying criteria for 30 PC Docs Open users interviewed.)

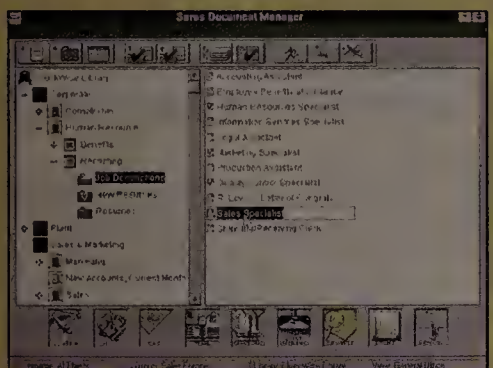
BUYING CRITERIA

Document retrieval	8.8
Document searching	8.5
Technical support	8.0
Windows integration	8.4
Ease of use	8.3
Document security	8.5
AVERAGE	8.4

COMMENTS

- Retrieval by file name, author, client, project and so on provides users with many options.
- Capable of performing full-text phrase searches but requires a large amount of storage.
- Users said support personnel would not give up until the problem was solved.
- Version 2.0 introduced PC Docs' first Windows interface. Users had no problems integrating with Windows applications.
- Customizable screens conform to individual users.
- Documents cannot be opened outside of PC Docs even with their native applications.

Saros Document Manager

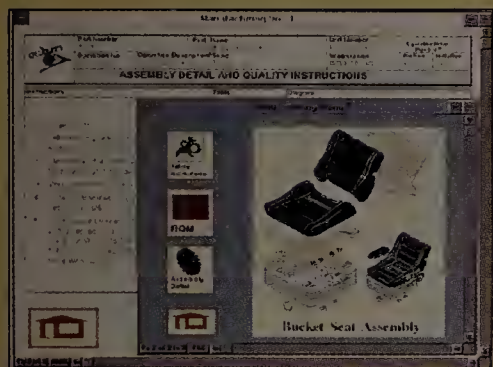


Document Manager's proprietary design makes integration with other products key. (These categories are the six most important buying criteria for 30 Saros Document Manager users interviewed.)

Document retrieval	8.0
Windows integration	8.6
Application integration	6.8
Document searching	7.9
Document security	8.6
Enterprise support	6.7
AVERAGE	7.8

- The product is linked with the specialized Mezzanine document database.
- Microsoft applications can be opened from the product's Windows desktop.
- The next version of Document Manager adds to the number of systems supported.
- Users can choose multiple search modes.
- Each document contains its own access control listing the users with privileges.
- Does not limit the number of servers on the network but requires Mezzanine database.

Intellecte



A framework with multiple plug-in products, Intellecte requires DBMS, audit and enterprise capabilities. (These categories are the six most important buying criteria for 30 Intellecte users interviewed.)

DBMS support	7.4
Enterprise support	7.6
Document audit trails	8.4
Document searching	7.5
Easy to use GUI	7.8
Application integration	6.3
AVERAGE	7.5

- Provides dynamic links to network DBMSs.
- Proprietary RDM engine provides cross-platform workflow.
- Users can customize audit functions.
- Full-text and hyperlinks are supported.
- The look of the Graphical Navigation Aid interface depends on the application being accessed. Users are looking for more consistency.
- Can accept data from other applications, but users want more capabilities.

Ratings are based on a 1-to-10 scale where 10 is most satisfied and 1 is least satisfied. Ratings are listed in order of importance. The average score is the average of all ratings shown.

BY KEVIN BURDEN

Ignore any vendor's claim that its document management product is an out-of-the-box solution — there is no such thing. Instead, think of document management as a process: The tools involved in managing documents are complex and different for every company. This is why vendors cannot offer cookie-cutter solutions.

Before choosing a product, users must fully assess their application makeup, infrastructure and expansion plans. Users also need to understand how documents are developed and worked on if a true match is to be made.

The products featured here — PC Docs, Inc.'s PC Docs Open, Saros Corp.'s Saros Document Manager and Interleaf, Inc.'s Intellecte — have the most installed base among the leading document management offerings.

PC Docs' Open

This product is an extremely easy-to-use and easy-to-install solution that is perfect for small workgroups but not limited to them, according to Scott McCreedy, a

director at International Data Corp. in Framingham, Mass. Several of the user companies interviewed use PC Docs Open for global wide-area networks.

"I still don't feel we've maxed this product out yet," says Pat Tripure, a computer technician at Stites & Harbison in Louisville, Ky. "And we have over 250 users in this site alone, plus two overseas offices. Each office uses its own libraries, but everyone [in three global offices] has access to them."

The current version, Open Version 2.0, replaced the DOS interface with a Windows rendition, making the product easier to use. Document profiles are fully customizable, letting users assign specific names to fields and place them where they want on the screen.

Although document searching and indexing scored well, indexing is the root of a backup problem. If the index is open during backup, it will not be backed up.

Saros' Document Manager

Billed as a document manager for large enterprises, Saros Document Manager is

not limited by the number of servers it can be installed on. If one server is busy or overloaded, Document Manager moves the workload to a different server.

"We have over 1,000 users and sometimes close to that many concurrent users. Without its off-loading, this system would crash all the time," says Jimmy Chen, director of systems management at Wells Fargo Bank in San Francisco.

Making Document Manager stand out is Mezzanine, Saros' SQL-based document server that loads on OS/2, Unix or Microsoft Corp. Windows NT workstations. While the flexibility of using the SQL server of choice is gone, users have a document-management-specific engine and a single system to administer rather than a separate, and often incompatible, task or application-driven system. With Mezzanine's document management roots, document retrieval and search capabilities were top-notch and highly rated.

Interleaf's Intellecte

Intellecte is a high-end integrated package of client/server tools that offers the

necessary document management elements — workflow, viewing and distribution. Based on the Relational Document Manager document management engine to store documents in their native format, Intellecte is a high-end application aimed at document-intensive business processes such as research and development and the scientific community, according to Jim Bair, research director at Gartner Group, Inc. in Santa Clara, Calif.

At the heart of Intellecte is its full-life-cycle methodology that maps out the system's core functions, such as document searching, retrieval and security.

Over a 12-week period, Interleaf and the user project team will install the repository foundation and design the point-and-click graphical user interface — so it doesn't look like a Windows clone. When complete, organizations will have a customized document management system to execute document searching, retrieval and a fully trained staff.

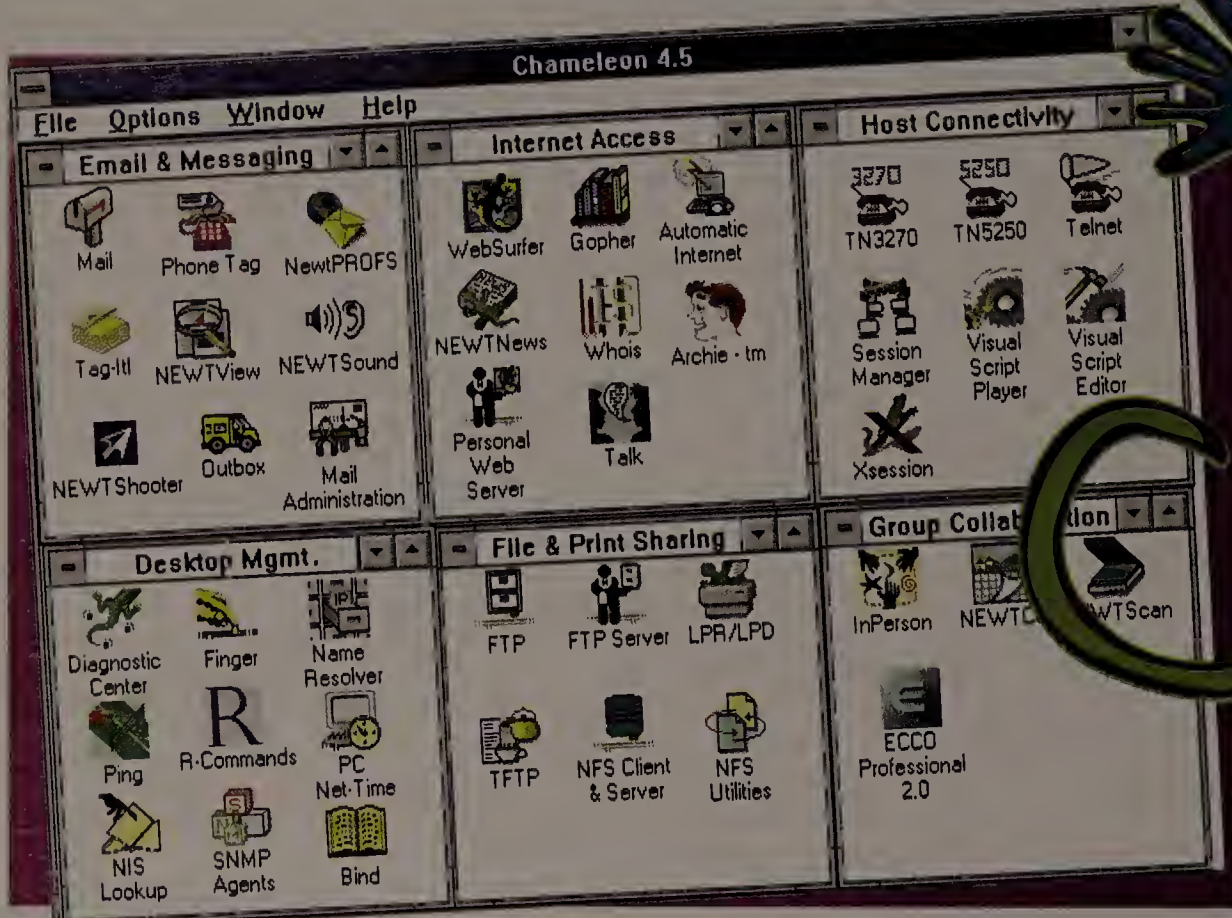
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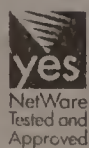
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Being there

BY PAUL YOUNGWORTH

Here's the story of an application developer's amazing discovery — he could cut user data entry time by 75% and save himself weeks, if not months, of tweaking programs just by observing users in their natural habitat

It's the little things that can get you.

We designed an "exclude" button for one of our client/server systems that lets financial users click on an item to exclude geographic regions when allocating expenses to a product. The button, a feature developers discussed with users during design, made it through testing without problems.

Too bad this innocent little button caused data entry to come to a dead stop, leaving the user staring at the computer screen in confusion.

I would never have known this feature was a showstopper if I hadn't spent an hour or so quietly observing users working with the system.

The coda to this story is that it took a mere 15 seconds to fix a problem that had the potential to cause users to miss critical business deadlines.

Welcome to what I call "programming by walking around."

I borrowed this phrase from the business concept of "management by walking around." In management by walking around, business executives visit suppliers, employees and customers to see how the company's product is made and used. The goal is quality improvement.

In my adaptation, programmers get up from their machines, leave their cubicles and observe "customers" (users) using the "product" (the application). The goal is to improve the quality of applications based on hands-on observation.

The exclude button incident underscored the fact that this type of observation on a programmer's part is absolutely essential to creating programs that work like users do.

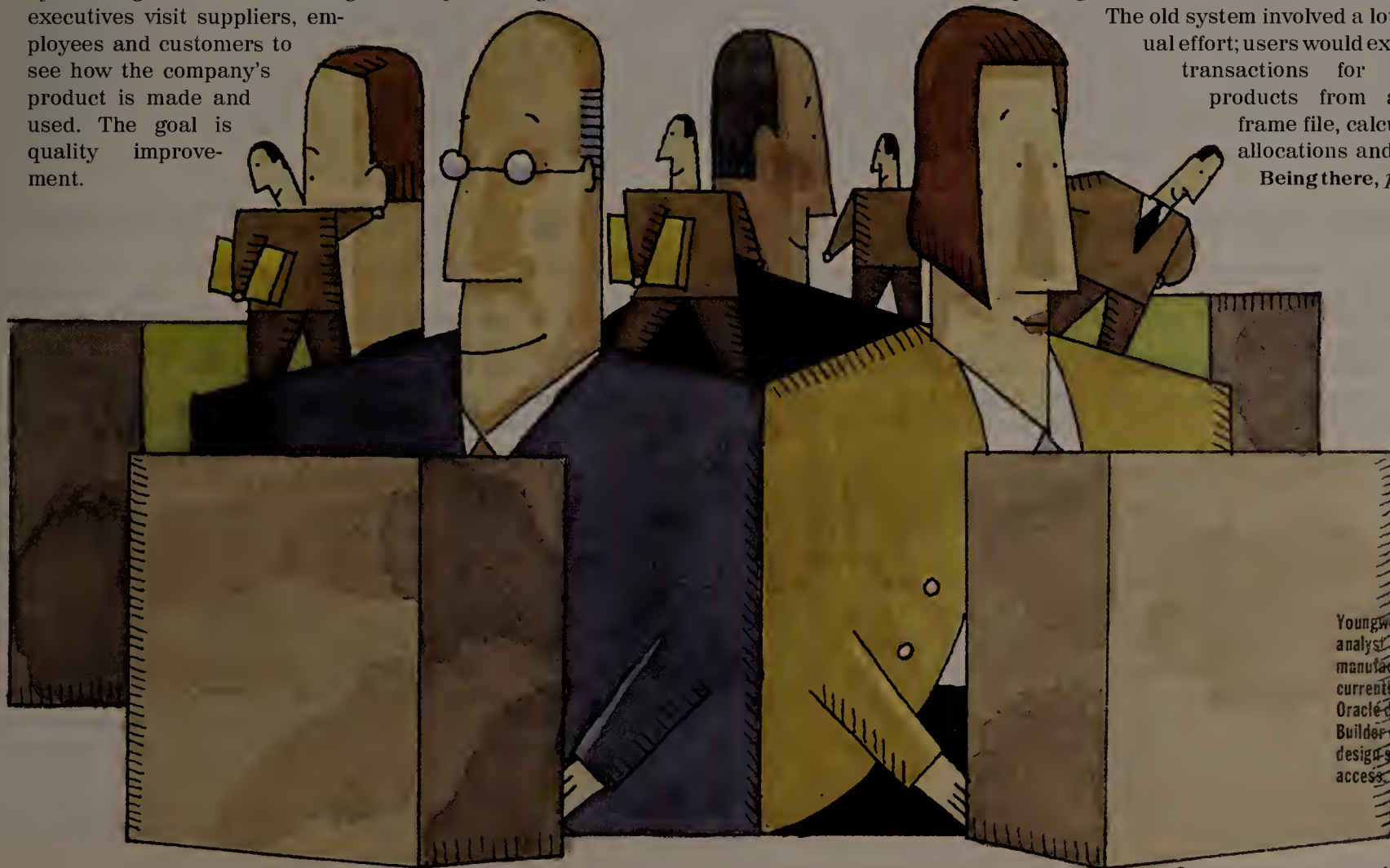
How it all began

I came upon the exclude button fiasco — and hence, programming by walking around — purely by accident.

I had developed an application that let users in finance allocate product expenses across selected transactions for that product. The results are used in month-end reporting.

The old system involved a lot of manual effort; users would extract the transactions for selected products from a main-frame file, calculate the allocations and key the

Being there, page 100



Youngworth is a programmer/analyst at a Midwest-based manufacturing company. He is currently working with the Oracle database and PowerBuilder development tool to design systems for end-user access.

ROBIN JARLAUX

Being there

CONTINUED FROM PAGE 99

results back into a database. Allocating expenses to a handful of items could require manually entering hundreds of transactions and take four to five hours.

The new system was designed to take advantage of a client/server environment to minimize data entry. It pulls transactions for each product from an Oracle Corp. server and displays them in a Sybase, Inc. PowerBuilder front-end application. Users can then point and click to select the transactions they want to include in the allocation.

With a click of the mouse, results are written back to the server.

After design, the application went through testing without snags. Because we were expecting some low-record count months, we had planned to wait before installing the program.

Then my phone rang. The call was from Tom in finance, one of the two primary users of the application.

"You know that program you designed to allocate expenses?" Tom asked. "Could you install it by Tuesday? We've got an unusually high number of products to enter, and we're going crazy." I agreed.

Tom hesitated a moment. "Could you sit in while we use it, just this once, because we're so close to a deadline?"

Sure, why not? After all, if there were a lot of transactions, the application would save users a lot of time. I had visions of basking in the compliments of satisfied users for a job well done.

Ring, ring

It didn't take long for my wake-up call. In Tom's work area I purposely placed my chair out of his line of sight. I wanted him to forget I was there.

Tom entered the first item code field and pressed "enter." The item description appeared. Tom was supposed to verify the description, then click on "retrieve." But he didn't. Instead, he waited for the list of transactions to fill the screen.

"Uh, you have to click on the retrieve button," I said. (This wasn't how it had worked in testing.)

The problem was pretty clear: Tom worked with the item codes so often it wasn't likely he would make a mistake, so he didn't need to verify every description. The retrieve button, which had made sense during design and testing, just got in the way when the user had a long list of products to enter and a deadline to meet.

He clicked the button and moved on. I made a note of the problem.

When the data filled the screen, Tom decided to sort by region. He clicked the region check box, hesitated a moment, then clicked the sort button.

In design, we talked about using a command button to verify actions such as sorting and filtering. We assumed these actions would tie up the program, if only briefly, and we didn't want the action to take place until the user confirmed it by

clicking a button. So the program required clicking a check box, then clicking a button to confirm the sort.

By observing Tom's actions as he entered data, I could tell that the sort button didn't make sense. After all, the program was sorting data in memory on the client. Even with hundreds of records, the action was instantaneous. The sort button was really a waste of time.

I made another note. I suspected this would be a quick fix; all I had to do was move the code from the sort button to each check box so the sorting would be done immediately as the user clicked each check box.

After a few records, Tom seemed to forget I was there and began concentrating on his data entry. By watching the movement of his eyes and the mouse pointer, I could feel the rhythm of the application. It was easy to notice the things that slowed him down.

My list of things to fix was growing—I was at about 20. Yet something strange was happening. Instead of feeling down because it wasn't going as smoothly as I'd anticipated, I was excited. I was elated because I knew most of the improvements on the list would be easy to implement, and the impact on user productivity would be tremendous. If the problem items had been reported one or two at a time, the total time to fix everything could have stretched over a couple of months or longer.

Then came the clincher—the mysteri-

Tips for effective developer fieldwork

You are likely to get the most information about your subjects' natural working habits if you keep a low profile. Here are some tips for observing users in action:

- ◆ When you talk to users about your visit, make it clear that you will be judging the application you've just installed—not their proficiency.
- ◆ Place yourself out of the way.
- ◆ Fight the temptation to offer unsolicited advice about their use of the application during the session. Be a silent observer as much as possible.



◆ If users seem distracted by other priorities, offer to come back at a more convenient time.

◆ If users seem unusually self-conscious because of your presence, try getting up for a drink of water or some other excuse and then quietly returning when they are concentrating on their work.

react the same way.

Tom finished his data entry and thanked me for sitting in.

I set myself up in Jenny's area in a similar observer position. I was in for a couple more surprises.

The first was that the exclude button was as problematic for Jenny as it was for Tom. The funny thing was, during prototyping, Jenny had asked for the button. But now, in the rhythm of data entry, she had completely forgotten about it.

Having observed Tom and now Jenny in action, I knew what the problem was. When they were testing the application, they were both concentrating solely on the software, and the exclude button was no problem. But in the real world, there are deadlines to meet, phone calls to take, visitors asking for reports and three things to do at once. In the real world, when Tom and Jenny click a check box to exclude a region, they want the data gone—at once—not after they find some namby-pamby button.

I was amazed that I wouldn't have known about the problem if I hadn't watched the application in action.

At your service

The second surprise came from Jenny's reaction when I agreed to a request she made. The application produced a report showing all the data entered into the system. But Jenny asked, rather sheepishly, if she could select a subset of the data, then get a printout of just those records. I quickly agreed, knowing it would be easy to present a window full of records, let the user click to select data and send the filtered window to the printer.

Programming by walking around is a good way to uncover design flaws, but for a client/server application, it is also an excellent way to take advantage of the technology to offer things that were never possible before. If I hadn't been watching over Jenny's shoulder, it's likely we never would have had that conversation.

Jenny finished her work, and I told her I would make the changes before the next processing cycle.

When I got back to my desk and started looking into the changes, I was surprised at how easy each one was. It took only 15 seconds to change the exclude action so it took place as soon as the user clicked on a region.

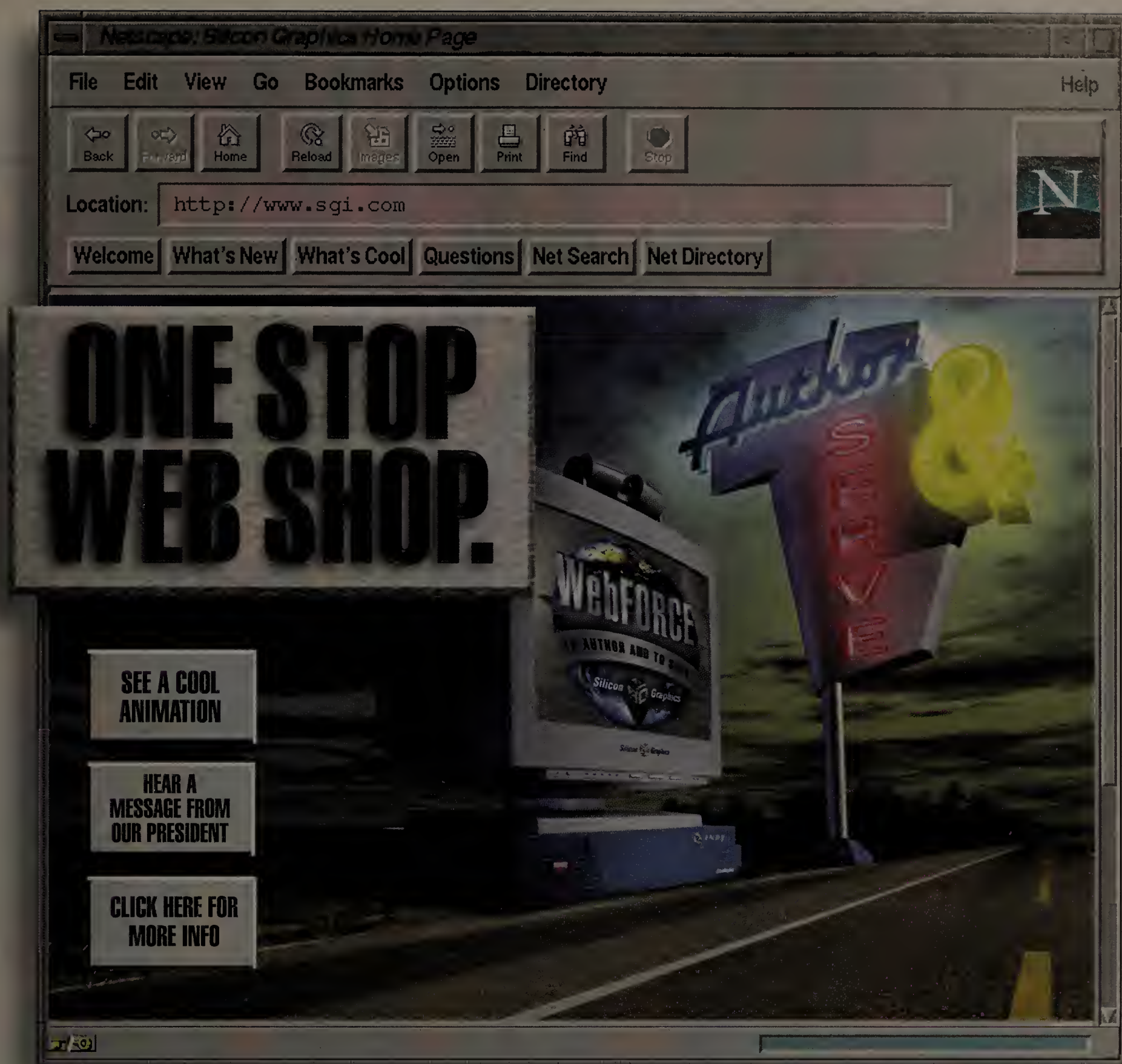
Most of the other changes went quickly as well—all were done in little over a day—with the help of the object-oriented, event-driven PowerBuilder.

Tom sent a note to his manager thanking me for the work I put into the application. He said it saved at least 75% of the data entry time.

I was anxious to hear Jenny's response after she used the revised application to enter the next round of data. "This is wonderful," she said. That was good enough for me.

As more of our projects move to client/server, I plan to discuss the benefits of this kind of hands-on observation with the rest of the development team.

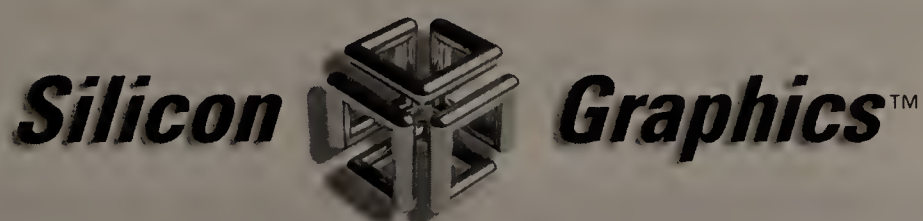
So the next time you install a client/server application, grab a chair and watch how it fares in the real world. Oh, and bring a notebook with you. ■



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Computer Careers



"Pigeonholed?"

IS professionals are bound to get stuck in a rut at some point in their careers, but managers are taking measures to prevent job-lock

BY JOHN WEBSTER

James Cameron

Project manager, programming
Sprint Corp., Rancho Cordova, Calif.

Avoids staff stagnation by: Broadening tasks, training in new languages.

As is the case at most companies, information systems managers at Sprint hate to see prized employees jump ship. Unfortunately, they've seen highly qualified but unhappy programmers give notice. It's a problem managers would like to avoid and, in turn, strongly encourage skill building and strengthening.

"That will help them get new projects," Cameron says. "We keep them challenged with projects and training in new languages."

"Our instruction includes interdepartmental training courses; sometimes we bring in people from universities or send developers to outside trainers," Cameron says. "We have a core curriculum that covers programming with the tools for Sun Solaris, Sybase and Windows, all of which we have running in-house."

Right now, Cameron has about 50 pro-

grammers and analysts who need training to become programmer/analysts. "We have analysts learning and doing a lot of initial data modeling, structures, flow and even initial designs of screens."

Sprint's conversion to a fourth-generation language will open new opportunities. "There's a lot of code that needs to be rewritten" using the newer languages, Cameron says.

One project where language training will come in handy, he says, is at Sprint's Dallas facility. "We have a mainframe with millions of lines of Cobol code. The long-term plan is to rewrite that using some of the latest code, like [the] DB2 and SQL languages."

George Waters

Communications manager
County of Sonoma, Santa Rosa, Calif.

Avoids staff stagnation by: Job swapping.

Job-related weariness is not just a problem for programmers; it's found in the corporate world, too. "Career paths at government agencies are not as [clear] as in civilian jobs," Waters says. "You can't move from what we call a

'tech' position to a 'manager' position without a rigorous written exam. Employees can only move into another tech level within their designated job category."

To spice up the lives of people in the county's communications department, Waters regularly rotates his staff's tasks. "Each person is a specialist, but we try to move them to different areas in the department." But before swapping jobs, each technician must go through six months of training.

Joe Hunter

IS manager
Baltimore Gas and Electric Co.,
Baltimore

Avoids staff stagnation by: Discussing opportunities in other business units.

No matter where you work, you'll always encounter employees who feel pigeonholed, Hunter says. But when a position opens in his department, he says, he's the first to look across the company for a replacement. His feeling is that skills are transferable from IS to other units and vice versa.

"Movement among departments is

done so people don't feel locked into one business unit. We show them we're moving people around and tell them they can look to other areas, business units, etc." If a person's skills are a good fit and that person has earned the right to transfer to the new position, Hunter says, he permits the move.

"In one case, I had a supervisory opening in an administrative area, and I picked a work leader in application development. They were ready for a promotion and were the most ready to take over the position. I also moved a systems analyst position into the auditing area."

Bill Taylor

MIS director
Citizen Watch Co., Los Angeles

Avoids staff stagnation by: Scouting new products to bring in-house.

Citizen keeps its programmers ticking with trips to informational forums and crash courses in new technologies, Taylor says. His two-pronged approach includes sending programmers to classes, technical conferences and trade shows and researching leading-edge hardware

Pigeonholed, page 105

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Computer Careers

Pigeonholed

CONTINUED FROM PAGE 104

and software. "If I see something new, I look at our situation. If I can cost-justify it, I'll bring it in and assign it to the next person who's earned it," he says.

Taylor recently brought in connectivity tools for Citizen's PC and IBM AS/400 environment. "I thought, 'Why can't we connect the PCs to the AS/400 to save money in wasted paper, among other things?'"

Taylor gave the connectivity job to someone who recently excelled in a watch-repair project. The new task involved installing a mouse-navigable menu system. "You can't have the same person sit and code and code and code. They need to expand their skills, and you need to boost their ego," Taylor says. "Sometimes programmers need a break to boost morale."

But that doesn't mean Taylor gives promotions simply because someone's due. Taylor says that before he makes a promotion or assigns a new project, he demands proof that staff members can handle the work. "Then I will throw a project at them, and they'll work on it until it's done," he says.

Lyle Wilson

Vice president of MIS

Florsheim Shoe Co., Chicago

Avoids staff stagnation by: Assigning comprehensive development projects.

At Florsheim Shoe Co., management turnover is so low that many upwardly

"Movement among departments is [encouraged] so people don't feel locked into one business unit."

—Joe Hunter,
IS manager,
Baltimore Gas
and Electric

mobile programmers might secretly want to see their superiors get the boot. According to Wilson, some programmers feel there's no room to grow.

"I've been here for 17 years and found that a lot of people [at all levels] don't think they'll move up quickly because of the seniority of management."

To assuage discontent, Wilson provides a steady flow of development projects. For example, the company's migration from DOS to MVS produced an abundance of work. "People working on the MVS system have been busy since the beginning, working on software that runs under MVS. There's still a lot of new work available as a result of the conversion," Wilson says.

In addition, the company's InfoCenter, a seven-person PC group, also offers new programming challenges. Although the department's PCs, PC applications and Unix servers are not configured for true client/server processing, programmers can learn about the commonly used hardware and software.

"When a position opens up in the InfoCenter, people want to get into the de-

partment to get the PC experience," Wilson says.

Vicente Sanchez

Systems and programming manager

Los Angeles Community College District,
Los Angeles

Avoids staff stagnation by: Leading by example.

At the Los Angeles Community College District, conversion to a Digital Equipment Corp. system has worn out the programming staff. In all, 29 Cobol programmers pitched in on the three-year project. Faced with a weary staff, Sanchez created a training program to give them an educational shot in the arm.

"We recently had a conversion effort from one system to another, and the programmers were really tired," he said. "We're almost finished, but they're feeling down from the long project."

To bolster morale, Sanchez led by example. "I taught myself Visual Basic, and I started a class [to teach the same]. It met once a week, and we would work our

way through the manual. That program got good feedback," he says.

Frank McKenna

Assistant vice president of

automation services

Federal Reserve Bank of
Chicago

Avoids staff stagnation by: Developing new growth paths.

Consolidation and centralization of computer systems and applications is making the

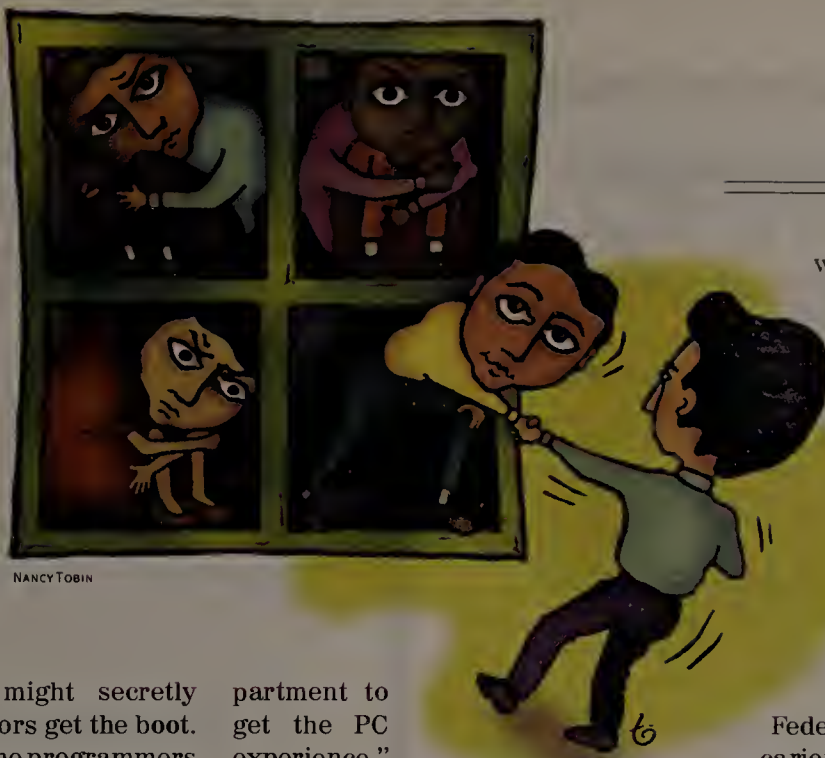
Federal Reserve Bank of Chicago a precarious place to work, especially for mainframe programmers. During the bank's transition to a client/server architecture, mainframe programmers know their next assignment could be their last in the familiar environment.

The core problem is, their mission at the bank is about to be scrubbed. "People here are starting to move to client/server, but the mainframe applications must be supported," McKenna says.

However, McKenna promises that "if people stay with us until the end of their projects, we'll train them in client/server systems. We made the commitment to train these people, even though they might change their careers [as a result]."

To keep spirits up, McKenna is clear about his long-term plans. "Our intention is to train [programmers] in client/server because we want to keep these talented people after their projects are finished."

Webster is a freelance writer in San Francisco.



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Submit your resume to: **Recruitment Specialist, Chugach Electric Association, Inc., 5601 Minnesota Drive, Anchorage, Alaska 99519-6300**

Anyone needing assistance with the application process should contact the Employee Relations Department at (907)762-4428. An Equal Opportunity Employer for All.



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SYSTEMS PROGRAMMER ANALYST - One position available to provide to provide technical support for the hardware/software **UNIX** platforms. **UNIX** operating systems, data communications, and training in I/S principles required. Great opportunity for a new grad; experienced mentor provided!

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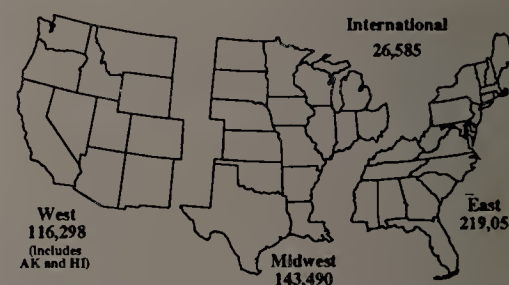
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Letter of application, resume, salary requirements, and names addresses and telephone numbers of at least two references should be sent to:

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The selected candidate will support MRP II software systems including responsibility for implementation, integration, and maintenance. Individual must have a BS and 5+ years experience with applications programming in an IBM MVS/CICS environment. Experience with MRP II systems is required.

For further information about this opportunity, please contact us by faxing or mailing your resume in confidence to: Thiokol Corporation, Robert J. Benford, 2475 Washington Blvd., MSA53, Ogden, Utah 84401. Fax 801-629-2324. We are an equal opportunity employer m/f/d/v.

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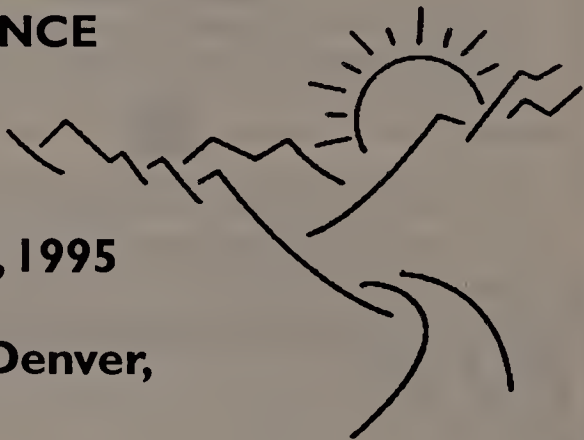
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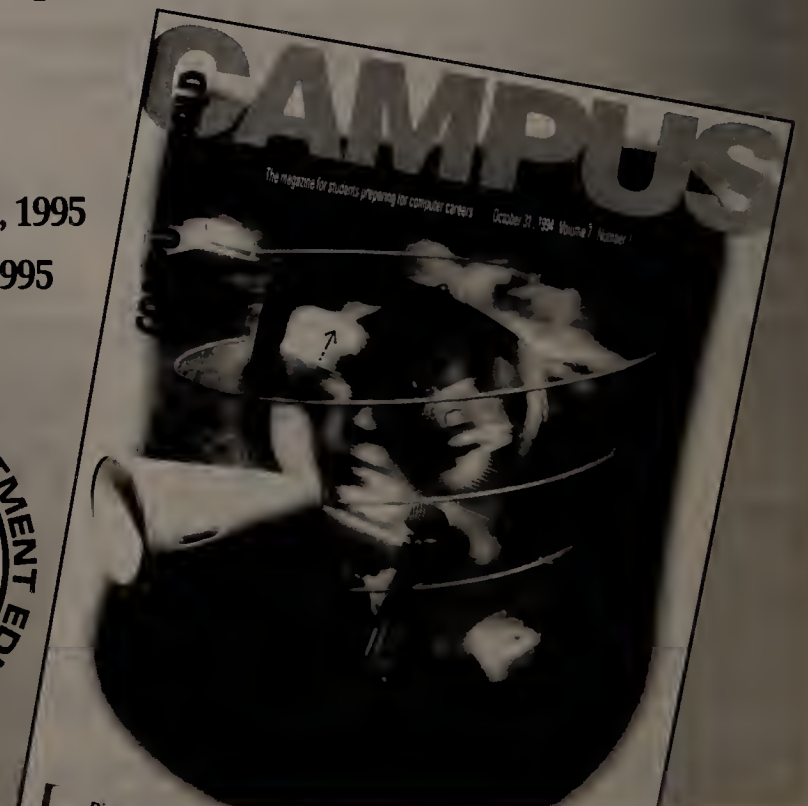
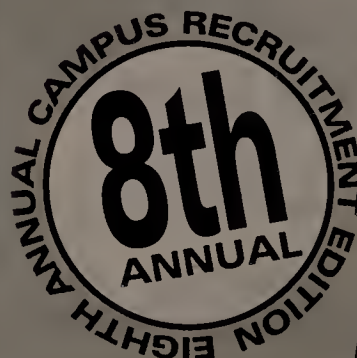
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DP service bureau/contract	
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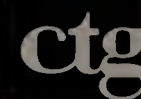
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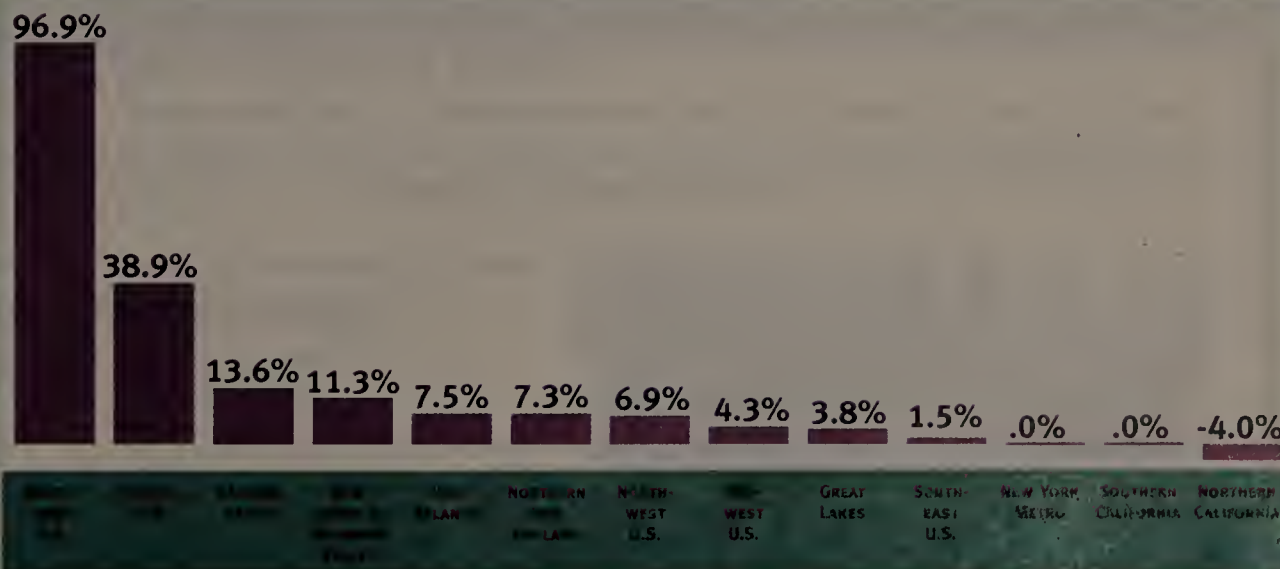
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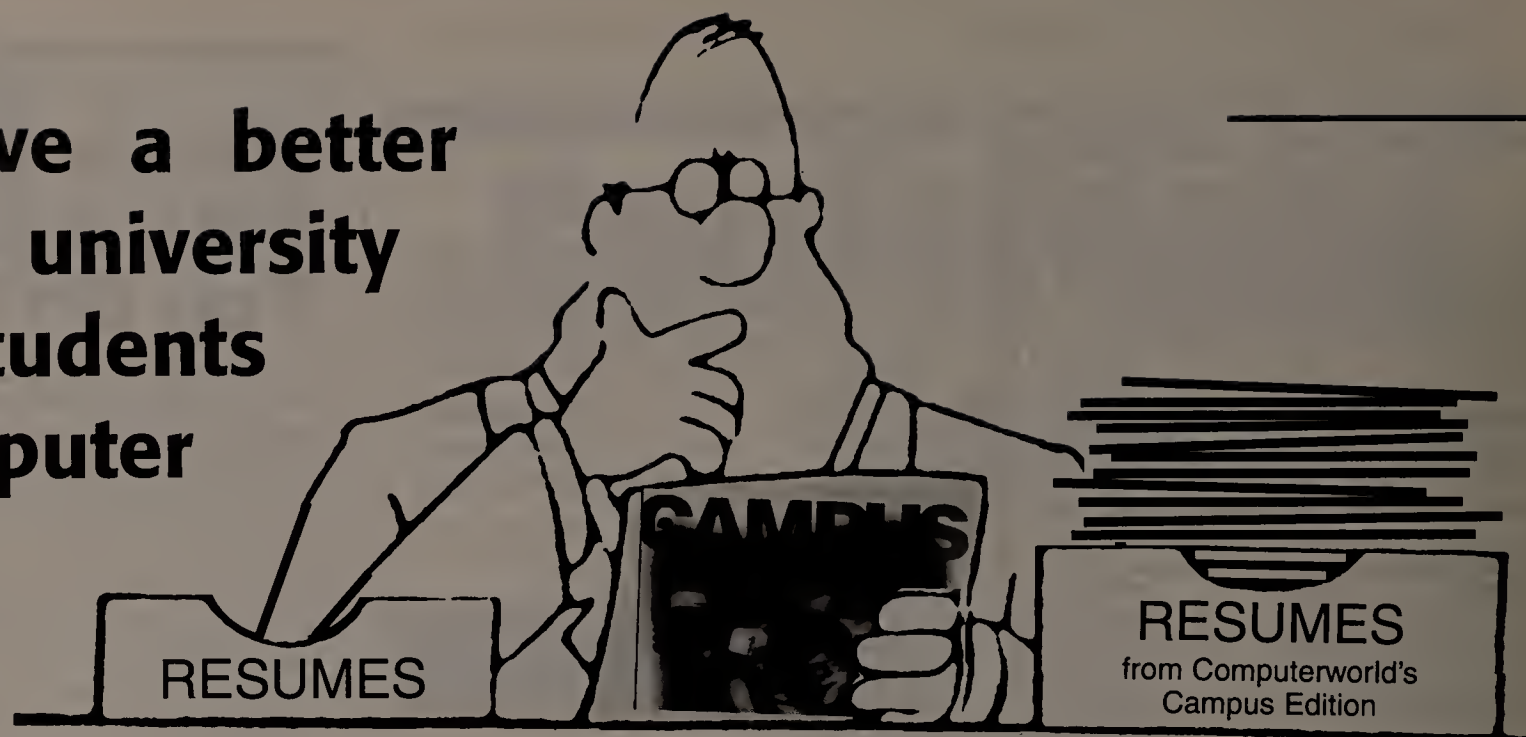
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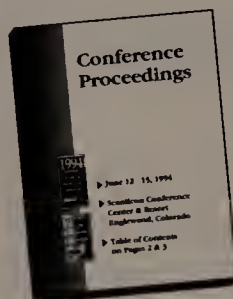
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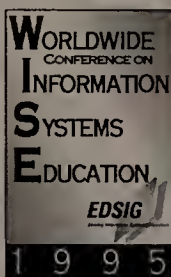
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President, AMCA, Inc.

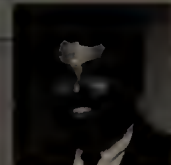
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TRACK 1: Survey Course on Recruiting Basics

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Gale Hering Varma
HR Director
Deloitte & Touche

TRACK 2: Career Options for Recruiting Professionals

How can you, the technical recruiter, develop professionally? In this session, you'll gain insight from a seasoned practitioner and HR expert on how you can grow and advance yourself in the recruiting and HR field.



Alan Alper
Editor
Computerworld's
Client/Server
Journal

TRACK 3: Why Can't I Find the Skills I Need When I Need Them?

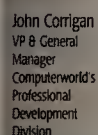
Advances in technology have a direct relationship with the amount of talent available to you. The newer the technology, the fewer the experts available. In this session, learn about this timeless topic and how to assign realistic expectations to your recruiting efforts and resources.



William S. Swan, Ph.D.
President
Swan
Consultants, Inc.

TRACK 4: Candidate Selection

Are you using research-proven methods and skills to enhance your interview and performance appraisal process? How can you apply behavioral interviewing techniques immediately? In this session, you'll learn about the "science behind the hiring process" from one of the field's leading experts.



John Corrigan
VP & General
Manager
Computerworld's
Professional
Development
Division

TRACK 5: Sourcing Techniques

What are the latest developments in sourcing techniques such as networking, joining technical associations, using online job and resume databases, advertising, open houses, job opportunity hotlines, employee referral programs and more? This peer to peer session will focus on what's working, why it is and how to use the best sources to your best advantage.



Harry J. Joe,
Esq.
Jenkins & Gilchrist

TRACK 6: Corporate Hiring Issues

What does the hiring future hold with "the virtual" office? What is the most contemporary update on immigration law? What do you need to know about the Americans with Disabilities Act? This track will offer the latest information to keep you current in your daily efforts.



David Petrie
Product Support
Manager
INFONET
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Moderated
Session

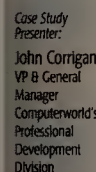
TRACK 7: Educator/Recruiter Summit

What's the contemporary view of I.S. education, especially as it relates to how recruiters must rely on the U.S. talent supply that emerges every year from America's campuses? This summit with I.S. educators who will simultaneously be attending the Worldwide Conference on Information Systems Education (WISE) will focus with your discussions on how to maximize your college relations and cooperative education efforts.

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The Recruitment Challenge

This highly interactive and fun half-day session will allow all educators and recruiters to participate in a real-world, team-building solution of a recruitment case study. Since this special session will occur on the last morning of the conference, aspects of previous sessions will be considered and applied in the case study. You won't want to miss this session, because an individual on the winning team will win a notebook computer compliments of Computerworld!



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Presenter:
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In this special one-day class held on Monday, June 12 and repeated on Tuesday, June 13, Susan Hodges, President of Semco, will cover the fundamentals of I.S. recruiting. Advance registration for this special class is required on a first-come, first-served basis and is limited to 20 conference registrants on Monday and another 20 registrants on Tuesday. (The cost of this one-day course is included in the conference registration fee.)

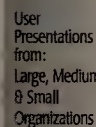


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Marketplace



Desktop imaging software

A market in transition

By Lynn Haber

As desktop imaging providers upscale their products by targeting the workgroup as well as the enterprise, the lines between imaging, document management and workflow are blurring.

In pursuit of a paperless office, these providers are offering increasingly sophisticated products to help integrate paper-based information in the form of images with other electronic documents such as applications, electronic mail and faxes.

But only in the past year or two have desktop imaging vendors come into their own, thanks to more powerful PC configurations with at least 8M bytes of RAM. And, unlike high-end production systems, these PCs target the everyday user.

Today's imaging solutions treat images as just another data type, making them an extension of workgroup and productivity software where data types such as text and graphics are commonly found. To that end, imaging is becoming less of a separate market.

"What we're seeing is image taking a backseat to workflow and document management software," says Carl Frappalo, executive vice president at Delphi Consulting Group in Boston. That is because once you capture an electronic image, you must do something with it such as store, retrieve, edit, annotate, track or send it.

As a result, the desktop imaging market comprises all types of products.

Some offer image capture or enable a PC to display a bit-mapped image and annotate, rotate, size and send it. Others provide indexing schemes, integrated workflow, faster retrieval, support for third-party databases and support for a variety of storage media and security. Additionally, many products are client/server-based and scalable to suit the enterprise.

A closer look

While the desktop imaging market has been around for a number of years, sales — which includes hardware, software, services, support and maintenance — were only \$157,539 in 1992, according to Pamela Boyle, a senior research analyst at BIS Strategic Decisions in Norwell, Mass. The market, which now includes more than two dozen vendors, is expected to reach \$2.9 million by 1998. But Boyle said she expects the numbers to shift as the lines between desktop imaging and document management continue to blur.

Some vendors offer products that exemplify the changing face of the market. For example, ImageFast Software Systems, Inc., Keyfile Corp., PaperClip Imaging Software, Inc., Watermark Software, Inc. and Westbrook Technologies, Inc. have recently introduced products with functionality previously found in document management or workflow software (see boxes at right). These vendors' products have also added scalability for use throughout the enterprise.

The following vendors are among those that have recently introduced products with functionality previously found in document management or workflow software:

ImageFast 3.0

Price: Stand-alone: \$995; networked version: approximately \$1,000 per seat.

Requires: 386-based PC with Windows 3.x, 4M bytes of RAM and hard disk.

Snapshot: A recently released client/server-based product, ImageFast 3.0 features a workflow component, Open Database Connectivity, scalability from one to 1,000 users, optical character recognition (OCR) and full indexing and retrieval. Targets middle to high-end users.

ImageFast Software Systems
McLean, Va. (703) 893-1934

PaperClip for Windows 3.0

Price: \$600 to \$1,000 per seat.

Requires: Image Server: a minimum of a 386-based PC, 2Mbytes of RAM and 80M-byte hard drive. Workstation: a minimum of a 386-based PC and 8M bytes of RAM.

Snapshot: Unveiled earlier this year, PaperClip for Windows 3.0 is a modular client/server-based product that can be used as a personal system or networked with 1,000 users. An SQL version that stores 30 million to 40 million documents exists.

PaperClip Imaging Software
Hackensack, N.J. (201) 487-3503

Keyfile 3.0

Price: Less than \$1,000 per seat. Volume discounts available.

Requires: A minimum of an Intel Corp. i486-based PC, 8M bytes of RAM and OS/2.

Snapshot: Recently introduced, Keyfile 3.0 is a client/server-based product suitable for enterprise-wide implementation. It is touted as a document management and workflow solution targeting data types such as paper, electronic, voice, video and so on.

Keyfile targeted three areas for Version 3.0 enhancements: version control, workflow and user interface/customization. Product availability: end of April.

Keyfile, Nashua, N.H.
(603) 883-3800

Enterprise Edition Series

Price: Stand-alone: \$295; 10-user: \$2,495; 100-user: \$21,995.

Requires: A minimum of an Intel i486-based PC, 8M bytes of RAM.

Snapshot: Enterprise Edition Series is a suite of client/server, document imaging products that offer enhancements such as back-end security, on-line backup and restore, performance monitoring and remote administration, and support for write-once, read-many and CD-ROM jukeboxes.

The product was designed to integrate easily with everything from mainframe applications and client/server development tools to ad hoc usage such as E-mail, fax and groupware.

Watermark Software
Burlington, Mass. (617) 229-2600

File Magic Plus 4 Series

Price: Stand-alone: \$1,795; five-user: \$3,750; 10-user: \$8,495.

Requires: A minimum of a 386-based PC and 8M bytes of RAM.

Snapshot: File Magic Plus 4 Series is document management software that targets the workgroup within the enterprise. Recent product enhancements include support for multiple open windows, document annotation, integrated E-mail support, support for Dynamic Data Exchange and Object Linking and Embedding, multiple database support and full text and zone capture for OCR.

Westbrook Technologies
Branford, Conn. (203) 483-6666

Despite similarities, subtle differences also exist among the imaging vendors' products. For example, Keyfile provides a turnkey file management system. Others such as PaperClip and Watermark were designed to be integrated into larger document management systems.

Additionally, more often than not, implementing a desktop imaging system requires the help of a value-added reseller. The reseller makes sure the network can handle moving images within a department or throughout the enterprise. ■

Haber is a freelance writer in Jamaica Plain, Mass.

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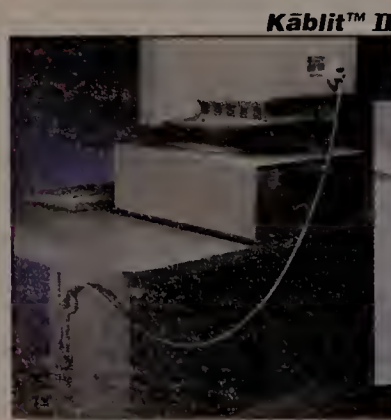
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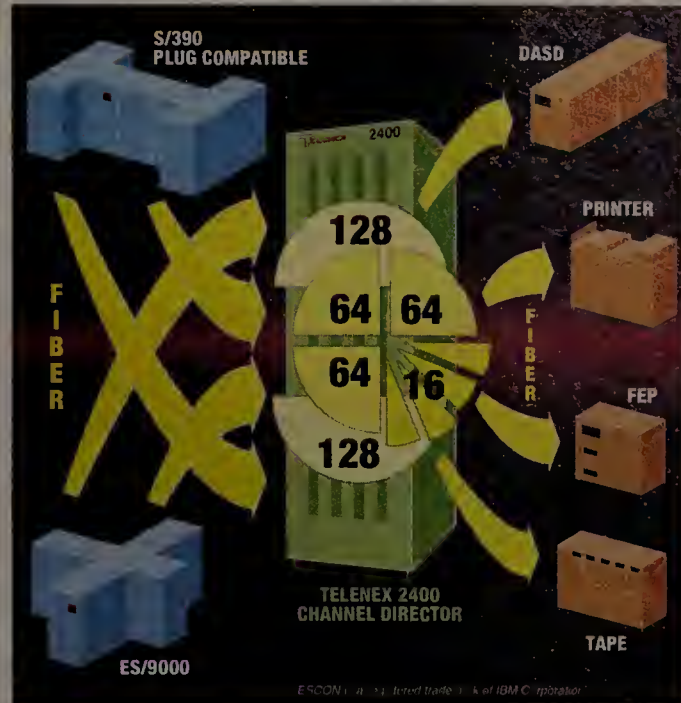


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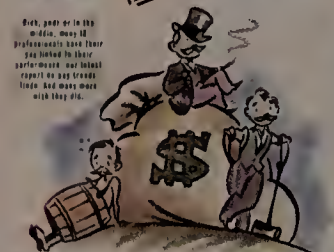
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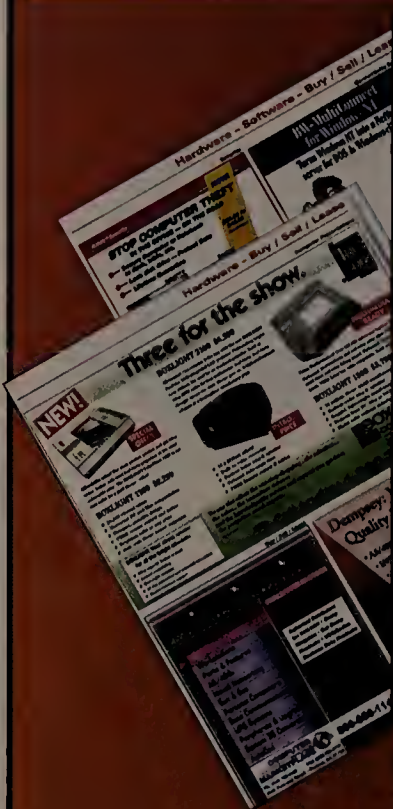
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AMERITECH CORP.	2.13	LEGENT CORP.	-4.75
PAYCHEX	2.00	STRATUS COMPUTER INC.	-4.63

OVERALL STOCKS PERFORMED WELL LAST WEEK, THOUGH NASDAQ SHARES AS A WHOLE DROPPED SLIGHTLY. LOTUS DEVELOPMENT CORP. SLIPPED WHEN IT ANNOUNCED LOWER THAN EXPECTED PROFITS FOR THE LAST QUARTER.

Fault-intolerant earnings

Stratus Computer, Inc. (SRA), which prides itself on its fault-tolerant systems, may wish its stock carried the same features. Wall Street is not happy with the Marlboro, Mass., company's estimate of poor earnings for the quarter ended March 31, and that disapproval is showing in its stock price.

Since topping out at about \$39 late last year, Stratus shares have been in a funk and now sit at 27 1/8. This coincides with the release of Stratus' Continuum product line, a complete revamp of the company's minicomputers.

"It's a transition that is clearly not as smooth as they have led us to believe," said Bruce Hadburg, vice president of research at Raymond James & Associates, Inc. in St. Petersburg, Fla. "I think the announcement was rushed."

One area of concern among analysts was the apparent lack of major user accounts and the reticence of current customers to discuss Stratus. "I'm not sure I could say no news is good news," Hadburg said. Stratus "wouldn't announce any firm customers when they rolled things out."

"Is it worth sacrificing quarterly results for an enhanced product result? Yes," said John Cassarini, an analyst at Smith Barney Shearson, Inc. in New York. But the current figures could become a long-term negative if market share drops, he added.

Continuum's pricing may be putting pressure on Stratus' numbers. "It is priced 30% to 40% less than their current systems. They have to make up for that lost revenue," Hadburg said.

The company expects to bounce back in the next couple of quarters, but high-end units of the Continuum line, which may pull in larger accounts, are not expected until year's end, according to Hadburg. — Tim Ouellette

Stratus loses altitude

After rebounding at the end of March, Stratus' stock took another fall last week



EXCH	52-WEEK RANGE		APR. 7 3 PM			Wk NET	Wk PCT	EXCH	52-WEEK RANGE		APR. 7 3 PM			Wk NET	Wk PCT
				CHANGE	CHANGE							CHANGE	CHANGE		
Communications and Network Services.								OFF 1.90%							
OTC	59.75	20.13	3 COM CORP.	54.13	-2.25	-4.0		OTC	70.00	29.75	LOTUS DEVELOPMENT	34.13	-3.88	-10.2	
NYS	44.38	36.63	AMERITECH CORP.	43.38	2.13	5.2		OTC	13.25	4.38	MAGIC SOFTWARE ENTERPRISES	4.75	0.25	-5.0	
NYS	57.13	47.25	AT&T	51.63	-0.25	-0.5		OTC	14.50	6.00	MANUGISTICS GROUP INC.	12.00	-0.50	-4.0	
OTC	19.75	12.75	8ANYAN SYSTEMS INC.	15.88	1.00	6.7		OTC	31.75	14.75	MAPINFO CORP.	29.50	1.25	-4.1	
OTC	39.50	18.63	8AY NETWORKS INC.	37.25	0.00	0.0		OTC	4.75	1.44	MATHSOFT	3.00	0.00	0.0	
NYS	58.38	48.38	8ELL ATLANTIC CORP.	54.00	1.25	2.4		OTC	31.00	6.50	McAfee ASSOCIATES	28.11	-0.89	-3.1	
NYS	63.50	50.50	8ELLSOUTH CORP.	60.63	1.50	2.5		OTC	16.38	9.38	MENTOR GRAPHICS	15.50	-0.25	-1.6	
NYS	22.25	10.00	8OLT, 8ERANEK & NEWMAN	18.88	-0.63	-3.2		OTC	20.00	11.00	MICRO FOCUS	11.38	0.25	2.2	
OTC	19.75	9.00	8ROOKTROUT TECHNOLOGY	17.25	0.50	3.0		OTC	8.00	4.63	MICROGRAFX INC.	6.00	-0.13	-2.0	
NYS	52.88	33.06	8ABLETRON SYSTEMS	44.00	-0.75	-1.7		OTC	74.13	41.13	MICROSOFT CORP.	70.13	-1.00	-1.4	
OTC	38.75	10.00	8CENTIGRAM COMMUNICATIONS	14.38	-0.88	-5.7		OTC	22.50	5.63	MINIMANAGEMENT INC.	17.75	-3.13	15.0	
OTC	50.50	21.00	8CHIPCOM CORP.	33.13	-4.38	-11.7		OTC	34.63	17.50	ORACLE CORP.	30.00	-1.50	-4.8	
OTC	40.00	18.75	8CISCO SYSTEMS INC. (H)	38.88	1.13	3.0		OTC	44.25	21.50	PARAMETRIC TECHNOLOGY	36.00	4.00	10.0	
OTC	13.63	6.13	8COMPRESSION LABS INC.	10.63	1.06	11.1		OTC	24.25	9.00	PARCPLACE SYSTEMS INC. (L)	12.13	-2.63	-17.8	
OTC	9.75	5.13	8COMPUTER NETWORK TECH.	8.00	-0.25	-3.0		OTC	48.75	13.00	PEOPLESOFT	41.25	-1.63	-3.8	
OTC	14.50	7.50	8CROSSCOMM	10.50	-0.25	-2.3		OTC	8.50	4.38	PHOENIX TECHNOLOGIES	7.13	-0.13	1.7	
OTC	4.13	2.00	8DATA SWITCH CORP.	3.00	-0.13	-4.0		OTC	14.75	3.50	PLATINUM SOFTWARE	8.63	-1.13	11.5	
OTC	39.00	17.88	8DSC COMMUNICATIONS	33.13	0.88	2.7		OTC	25.25	12.00	PLATINUM TECHNOLOGY	16.00	-4.25	-21.0	
OTC	41.75	10.00	8FORE SYSTEMS INC.	33.75	-6.63	-16.4		OTC	59.50	27.00	PROGRESS SOFTWARE CORP.	48.50	-3.25	-6.3	
NYS	35.88	10.00	8GENERAL DATACOMM INDS.	14.13	-0.63	-4.2		OTC	4.50	1.88	QUARTERDECK CORP.	4.06	0.03	0.8	
NYS	34.88	29.50	8GTE CORP.	34.13	0.63	1.9		OTC	18.75	9.50	RAINBOW TECHNOLOGIES INC.	16.50	1.00	6.5	
NYS	104.38	77.00	8ITT CORP. (H)	101.63	0.25	0.2		OTC	6.13	2.00	RASTEROPS	4.00	-0.50	-11.1	
OTC	25.88	17.25	8MCI COMMUNICATIONS CORP.	21.06	0.38	1.8		OTC	6.13	2.88	ROSS SYSTEMS	5.50	-0.13	-2.2	
OTC	15.75	5.88	8MCOM COMMUNICATIONS CORP.	7.50	0.38	5.3		OTC	13.00	0.50	SAPIENS INT'L. CORP. N.V.	3.69	-1.19	-4.8	
OTC	12.63	4.50	8MICROCOM INC.	11.13	-0.13	-1.1		OTC	29.13	10.00	SOFTKEY INTERNATIONAL INC.	25.50	-1.50	-5.6	
OTC	10.50	4.00	8NETRIX CORP.	7.25	-0.13	-1.7		OTC	6.25	3.00	SOFTWARE PUBLISHING CORP.	3.50	0.00	0.0	
OTC	7.38	3.25	8NETWORK COMPUTING DEVICES	6.88	0.50	7.8		OTC	12.25	5.00	STATE OF THE ART (H)	11.25	-0.63	-5.3	
NYS	27.88	7.38	8NETWORK EQUIPMENT TECH.	22.75	-2.13	-8.5		NYS	38.38	25.00	STERLING SOFTWARE INC.	34.25	-1.25	-3.5	
OTC	30.63	13.88	8NETWORK GENERAL	26.75	-1.63	-5.7		OTC	15.13	3.63	STRUCT. DYNAMICS RESEARCH	9.06	0.56	6.6	
NYS	57.38	26.50	8NEWBRIDGE NETWORKS CORP.	30.13	-2.63	-8.0		OTC	57.00	22.00	SYBASE INC. (L)	25.88	-14.38	-35.7	
NYS	40.00	26.00	8NORTHERN TELECOM LTD.	38.13	0.13	0.3		OTC	24.50	9.88	SYMANTEC CORP.	20.50	-2.63	-11.4	
OTC	21.50	13.38	8NOVELL INC.	18.63	-0.25	-1.3		OTC	54.75	33.00	SYNOPSYS	47.75	-0.25	-0.5	
NYS	41.50	33.88	8NYNEX CORP.	40.13	0.50	1.3		OTC	28.88	10.63	SYSTEM SOFTWARE ASSOC.	23.75	-1.31	-5.2	
OTC	24.50	15.50	8OCTEL COMMUNICATIONS CORP.	19.88	-1.38	-6.5		OTC	7.75	3.25	TRINZIC CORP.	5.63	-0.88	-13.5	
OTC	38.50	12.00	8OPTICAL DATA SYSTEMS INC. (H)	35.50	1.00	2.9		OTC	28.00	7.88	VIEWLOGIC SYSTEMS	8.88	0.13	1.4	
OTC	6.50	2.13	8PENRIL DATA COMM NETWORKS	4.00	-0.25	-5.9		OTC	23.25	12.00	VIMARK SOFTWARE INC.	12.00	-1.50	-11.1	
OTC	38.25	10.00	8PICTURETEL CORP. (H)	36.25	-1.25	-3.3		OTC	10.75	5.50	WALKER INTERACTIVE SYSTEMS	6.88	-0.13	-1.8	
OTC	8.13	2.13	8PROTEON INC.	5.75	-0.25	-4.2		OTC	55.50	22.50	WALL DATA INC.	22.50	-23.25	-50.8	
OTC	10.00	2.75	8RACOTEK INC.	6.00	-0.25	-4.0		Semiconductors UP 0.44%							
OTC	8.63	3.50	8RETIX	4.38	-0.13	-2.8		NYS	36.50	22.25	ADVANCED MICRO DEVICES	36.50	2.88	8.6	
NYS	24.88	12.44	8SCIENTIFIC ATLANTA INC.	22.75	-0.50	-2.2		NYS	28.13	16.34	ANALOG DEVICES INC.	25.50	0.13	0.5	
NYS	44.38	38.50	8SOUTHWESTERN BELL CORP.	42.88	0.88	2.1		OTC	42.38	19.75	ATMEL CORP.	38.88	-0.13	-0.3	
NYS	40.13	25.88	8SPRINT CORP.	31.75	1.50	5.0		OTC	8.88	3.63	CHIPS AND TECHNOLOGIES	8.00	0.50	6.7	
OTC	31.63	13.38	8STANDARD MICROSYSTEMS CORP.	16.63	0.25	1.5		OTC	38.88	21.00	CIRRUS LOGIC	35.13	0.63	1.8	
OTC	47.00	8.50	8STRATACOM INC.	42.25	-0.38	-0.9		NYS	32.25	13.88	CYPRESS SEMICONDUCTOR CORP.	28.75	0.13	0.4	
OTC	12.88	3.88	8TELEBIT CORP.	6.50	0.56	9.5		NYS	20.13	13.38	DALLAS SEMICONDUCTOR	17.25	-0.63	-3.5	
OTC	72.00	24.00	8US ROBOTICS	65.25	1.63	2.6		OTC	31.75	14.75	INTEGRATED SILICON SYSTEMS	28.00	-1.00	-3.4	
NYS	43.75	34.63	8US WEST INC.	40.88	0.88	2.2		OTC	90.13	56.00	INTEL CORP. (H)	87.13	1.75	2.0	
OTC	24.75	12.75	8XIRCOM	12.94	-1.06	-7.6		NYS	58.38	16.75	LSI LOGIC CORP.	53.38	0.13	0.2	
OTC	28.00	8.00	8XYLOGICS INC.	17.50	-2.00	-10.3		OTC	27.13	14.75	LATTICE SEMICONDUCTOR	23.75	-0.63	-2.6	
PCs and Workstations OFF 0.21%								NYS	85.13	28.25	MICRON TECHNOLOGY	76.75	0.13	0.2	
OTC	6.50	3.50	ADVANCED LOGIC RESEARCH	4.75	0.25	5.6		NYS	64.75	42.13	MOTOROLA INC.	55.00	0.75	1.4	
OTC	48.06	24.63	APPLE COMPUTER INC.	36.88	1.75	5.0		NYS	21.50	14.38	NATIONAL SEMICONDUCTOR	18.25	0.88	5.0	
OTC	21.25	10.38	AST RESEARCH INC.	16.38	0.56	3.6		OTC	29.25	6.75	SIERRA SEMICONDUCTOR	23.63	-2.00	-7.8	
NYS	44.38	29.50	COMPAQ COMPUTER CORP.	31.75	-2.63	-7.6		NYS	98.00	63.25	TEXAS INSTRUMENTS	90.75	1.00	1.1	
OTC	47.75	21.25	DELL COMPUTER CORP.	43.64	0.02	0.0		OTC	18.75	10.25	VLSI TECHNOLOGY	18.13	0.44	2.5	
OTC	25.25	9.25	GATEWAY 2000 INC.	17.00	-1.63	-8.7		OTC	6.88	1.78	WEITEK	3.63	0.25	7.4	
NYS	125.00	71.88	HEWLETT PACKARD CO.	119.50	-0.88	-0.7		ASE	19.38	11.50	WESTERN DIGITAL CORP.	13.38	-0.50	-3.6	
NYS	38.00	18.75	SILICON GRAPHICS	34.50	-1.25	-3.5		OTC	72.25	29.00	XILINX	63.75	-4.00	-5.9	
OTC	37.63	18.25	SUN MICROSYSTEMS INC.	34.44	-0.06	-0.2		OTC	38.50	24.75	ZILOG INC.	35.50	-0.50	-1.4	
NYS	52.38	31.00	TANDY CORP.	48.88	1.00	2.1		Peripherals and Subsystems UP 1.17%							
OTC	16.00	2.38	ZEOS INTERNATIONAL LTD.	11.38	0.25	2.2		OTC	25.75	14.50	AMERICAN POWER CONVERSION	15.75	-0.75	-4.5	
Large Systems OFF 2.22%								OTC	27.25	14.75	8ANCTEC INC.	15.75	0.00	0.0	
ASE	12.25	5.25	AMDAHL CORP.	12.13	1.00	9.0		OTC	5.75	3.25	8CAMBEX CORP.	4.75	0.25	5.6	
NYS	8.88	4.38	CONVEX COMPUTER	4.88	-1.75	-26.4		ASE	4.00	1.38	8COGNITRONICS CORP.	2.69	0.00	0.0	
OTC	2.63	0.19	CRAY COMPUTER	0.22	0.03	16.7		NYS	16.13	9.00	8CONNER PERIPHERALS	9.63	0.00	0.0	
NYS	28.38	14.63	CRAY RESEARCH INC.	18.88	0.75	4.1		OTC	24.00	9.75	8CREATIVE TECHNOLOGIES INC.	12.25	0.00	0.0	
NYS	12.00	6.63	DATA GENERAL CORP.	7.38	0.13	1.7		OTC	9.88	3.50	8DATA RACE INC.	9.50	0.25	2.7	
NYS	39.88	18.25	DIGITAL EQUIPMENT CORP. (H)	39.88	2.00	5.3		ASE	7.63	4.13	8DATARAM CORP.	5.00	-0.13	-2.4	
OTC	6.38	1.72	ENCORE COMPUTER CORP.	2.59	0.09	3.8		NYS	24.00	12.38	8EMC CORP.	17.00	0.13	0.7	
OTC	18.50	6.50	HARRIS COMPUTER SYSTEMS COR	15.00	-2.50	-14.3		OTC	20.13	3.50	8EMULEX CORP.	17.25	-1.75	-9.2	
NYS	85.13	51.38	I8M	84.88	2.13	2.6		OTC	19.50	11.25	8EVANS & SUTHERLAND	15.00	-0.50	-3.2	
OTC	15.75	5.00	NETFRAME	5.94	-0.56	-8.7		OTC	24.00	14.00	8EXABYTE	16.38	-1.00	-5.8	
OTC	7.88	3.63	PARALLAN COMPUTER	5.88	-0.13	-2.1		OTC	9.25	1.88	8INTELLIGENT INFO. SYSTEMS	2.88	0.06	2.2	
OTC	21.25	11.13	SEQUENT COMPUTER SYS.	16.25	-0.38	-2.3		OTC	9.94	1.59	8IOMEGA CORP. (H)	9.94	2.81	39.5	
OTC	5.88	3.13	SEQUOIA SYSTEMS INC.	3.94	-0.06	-1.6		OTC	8.00	2.00	8IPL SYSTEMS INC.	4.25	0.25	6.3	
NYS	39.88	22.88	STRATUS COMPUTER INC.	27.38	-4.63	-14.5		OTC	33.50	17.00	8KOMAG INC. (H)	31.81	0.06	0.2	
NYS	19.75	10.50	TANDEM COMPUTERS INC.	14.63	-1.25	-7.9		OTC	7.63	2.63	8MAXTOR CORP.	4.13	-0.25	-5.7	
OTC	15.50	3.88	TRICORD SYSTEMS	4.75	-0.38	-7.3		OTC	11.50	4.00	8MICROPOLIS CORP.	4.88	-0.25	-4.9	
NYS	14.88	8.25	UNISYS CORP.	9.63	0.38	4.1		OTC	17.75	9.25	8PINNACLE MICRO INC.	12.88	0.75	6.2	
Software OFF 4.80%								OTC	28.75	5.16	8PRINTRONIX INC.	19.88	-0.13	-0.6	
OTC	52.75	21.50	ADOBE SYSTEMS INC.	47.50	-2.13	-4.3		NYS	10.75	5.25	8QMS INC.	5.63	-0.13	-2.2	
OTC	6.00	2.50	AMERICAN SOFTWARE INC.	3.88	0.00	0.0		OTC	19.38	11.63	8QUANTUM CORP.	15.56	0.56	3.8	
OTC	44.00	23.25	AUTODESK INC.	41.00	-1.38	-3.2		OTC	15.50	7.38	8RADIUS INC.	13.56	1.06	8.5	
OTC	5.38	1.75	8BACHMAN INFO. SYSTEMS	4.63	0.13	2.8		NYS	14.13	6.38	8RECOGNITION INTERNATIONAL	6.63	-0.13	-1.9	
OTC	30.25	20.50	8BS SYSTEMS INC.	28.25	0.25	0.9		OTC	7.00	4.13	8REXON INC.	4.38	-0.13	-2.8	
OTC	69.75	40.25	8BC SOFTWARE INC.	60.00	-2.25	-3.6		OTC	28.63	18.63	8SEAGATE TECHNOLOGY	28.13	0.38	1.4	
OTC	30.50	15.31	8BOOLE & 8ABBAGE	28.75	1.44	5.3		NYS	39.13	17.88	8STORAGE TECHNOLOGY (L)	18.25	-0.75	-3.9	
OTC	14.38	6.00	8ORLAND INT'L INC.	7.88	-0.88	-10.0		NYS	42.88	27.38	8TEKTRONIX INC.	42.88	2.38	5.9	
OTC	22.25	5.75	8BROCK CONTROL SYSTEMS INC.	6.88	-0.13	-1.8		NYS	120.50	90.63	8XEROX CORP.	115.75	-2.00	-1.7	
OTC	3.75	1.78	8CE SOFTWARE	3.25	0.06	2.0		Services UP 1.28%							
ASE	27.00	6.25	8CHEYENNE SOFTWARE INC.	15.38	1.25	8.8		OTC	21.88	13.16	AMERICAN MGMT. SYSTEMS (H)	21.00	2.25	12.0	
OTC</															



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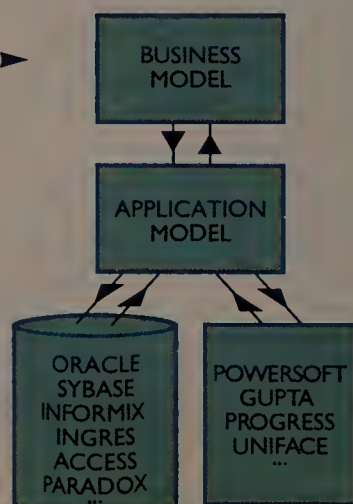
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User politics

CONTINUED FROM COVER 1

owns the data, who is allowed to buy, and who do you have to tell to make things happen," he said.

Take the case of Terry Tung, a senior information manager at Morrison-Knudsen Corp. in Cleveland. When his firm ran into problems with its Platinum Software Corp. system, he got hit with a double whammy: sparring with his software provider while trying to keep peace internally.

Tung said users were involved in the software selection process, but they now blame him and the IS department for the choice of Platinum. In the meantime, Tung and Platinum have not yet resolved the performance problems with the upgraded version of the client/server software.

Tung's story is just one example of the many political pitfalls IS departments stumble into along the path to client/server. Many IS managers now find that the safest route to avoiding such internal strife is to clearly define project roles from the start.

Roles clearly defined

For example, Suburban Propane Co. in Whippany, N.J., is now wrapping up a project with SAP America, Inc.'s client/server software. While the IS department received feedback from users, IS was the ultimate decision-maker, said Steve Wells, chief information officer.

Meanwhile, Wells recalled how a small band of IS staffers had earlier pushed for PeopleSoft, Inc.'s human resources software as he was opting to go with a full suite from SAP.

"They are all behind it now, but it was a hard sell," Wells said. "If it didn't work, they would have jumped up and said, 'I told you so. You should have gone with the other [one].'"

Change equals conflict

Some industry consultants say it is impossible to avoid political skirmishes when deploying client/server systems because the switch forces a change in roles for IS and end users.

Wells said he wanted all the application software to come from a single source because it would be easier to manage. He said SAP spent time with Suburban users to show them what the software would do to enhance its human resources modules. Eventually, that won them over.

Clark USA, Inc. in St. Louis also attributes the success of its client/server project to spelling out the responsibilities for users and IS. The oil company's corporate accounting department owned the

client/server software, while IS played a strictly background, consulting role.

Even with clearly defined roles, however, industry consultants said problems can still arise when users or IS staffers get attached to a particular product or approach.

Evan Wride, former IS director at Nissan Motor Corp. in Carson, Calif., recalled some political maneuverings as his company selected PeopleSoft software last year. Wride said PeopleSoft marketed directly to his end users, who in turn lobbied hard for the vendor.

Yet IS objected because PeopleSoft's product did not support the Sybase, Inc. products on which Nissan had previously standardized. But by this point, end users were "enamored with the product," Wride said. Eventually, he had to purchase a stand-alone Oracle Corp. version of the PeopleSoft application on the condition that PeopleSoft provide a Sybase version this year.

Consultants also said that tension may be impossible to avoid if users and IS staffers each believe they know best.

"The trick is to put IS in the users' world and do the project from there," Parkinson said. "It shows the users that it is not easy and IS is working hard, and it lets IS see what really happens with users."



MCI 'mobilizes' sales force

CONTINUED FROM COVER 1

generate only small demand. The spokesman said IBM has ramped up manufacturing and can meet the needs of both MCI and at least some other customers.

By automating and mobilizing the sales force, Ellenberger said MCI believes it can bring just-in-time manufacturing concepts to the information services world.

For instance, giving salespeople on-line remote access to MCI's entire product information database will enable them to instantly respond to customer questions. What is more, on-line access to the MCI Library, an intelligent, agent-driven database, will link salespeople with co-workers who can answer questions that they cannot.

Also, by taking the best presentations and proposals from its top salespeople and making them available to the sales force in template form, MCI hopes to drive overall sales performance levels much higher.

A mobile first

Analysts said MCI's bold move places it on the cutting edge of mobile project technology.

"The kind of connectivity they're talking about there is critical to the process, and almost no one is doing that," said Tim Bajarin, president of Creative Strategies Research International, Inc. in San Jose, Calif.

"If they can do it and it becomes a leading-edge issue, then a lot of people are going to have to see if they can do it," he said.

Guy Woodlief, an analyst at Dean Witter Reynolds, Inc. in New York, said MCI has a history of being able to quickly implement new ideas, and that it looks to be a step ahead of its competitors with this latest project.

"All the carriers are coming to the realization they need to put

big, long juicy minutes on their lines. MCI is probably in the lead at this point, though certainly AT&T has the resources to respond," Woodlief said. "Juicy" minutes for services besides phone conversations are MCI's goal.

Ellenberger said he championed the project because it gives the company both an opportunity to catapult itself into entirely new lines of business and the potential to change the way many businesses operate. MCI points to videoconferencing, document sharing, Internet access and other technology-driven products as its new revenue generators.

"When AT&T and Sprint and [every other company] that competes against me sees this, they're going to have to do this," Ellenberger said.

Cost of sales

Cost per sales representative to select, purchase/develop and implement sales force automation systems by company size

Annual company revenue	Average cost per sales rep
Less than \$10M	\$2,682
\$10M to \$100M	\$3,231
More than \$100M	\$6,854

Source: Culpepper and Associates, Inc., Atlanta

To make it all work, MCI partnered with a range of third-party developers. It is using RemoteWare 2.0, an OS/2-based management and development tool from Xcelsius, Inc. in Atlanta as its communications platform. RemoteWare's Communication Management Services module sits on dedicated servers and connects SQL and Oracle Corp. databases to client notebooks that use Aurum Software, Inc.'s SalesTrak 5.1, a customizable lead management tool. Entex Information Services, Inc. in Rye Brook, N.Y., is handling configuration and delivery of the systems.

The project has three phases. The first is the deployment phase, which now is in progress. The second phase will take place in August when MCI will connect all the salespeople to its information center. The third and ongoing stage is the reworking of MCI's office space into "Rally Centers." The Rally Centers, which are a variation on the virtual office scheme under way at many companies, should greatly reduce MCI's office costs.

Ellenberger said he expects the project to dramatically boost productivity at MCI and make a "significant" impact on the bottom line based on early pilot analysis and anecdotal evidence, including his own experiences as one of the pilot testers of the project.

Execution worries

Yet while the company thinks its year-long planning cycle will ensure a smooth-running project, execution is a definite concern.

"We have things in place, but we'll have to see how it gets executed," said Rahim Shah, a senior manager in the field automation project. His main worry is that IBM will fail to deliver its high-end 755CD notebooks in a timely fashion. "I would like to deploy all my laptops to the field tomorrow. The field is ready ... but I can't get enough laptops," he said.

MCI's attempt at corporate change, while exciting, has taken a personal toll on Shah. "I'm losing all my hair," he lamented. "I hardly have anything left on my head."

Losing hair is highly preferable to rolling heads, of course. Ellenberger, when told of Shah's problem, chuckled and said, "I'm glad to hear they're working hard. I'm not tolerant of not making the time frames we have."

Such is the price of change.

Remote access vendors are coming out of the woodwork. See page 54

Doing their homework

Despite the brute speed of the project, MCI appears well prepared to handle the various pitfalls that typically plague sales force automation efforts.

For instance, MCI's salespeople have previously had limited access to computers. A typical MCI branch has one computer for every 10 people, said Rahim Shah, the senior manager imple-

menting the project.

So members of the Field Automation Project team went to every MCI branch and interviewed salespeople about how they spend their time. Then the company did an alpha pilot with 110 users in 11 branches.

Feedback persuaded MCI to revise its training. It then staggered seven days' worth of training over a three-month period so

it would not overwhelm users with too much training at once. It also changed the help desk support structure to be more responsive. For instance, many salespeople had called for help on weekends and could not get an answer until the next business day. Now those calls are answered within 15 minutes.

And because of the change involved in working outside of the office, MCI's human resources department developed a change management seminar.

—Michael Fitzgerald

Prepare to be caught in the 'net

As an IS manager, why should you give a second thought to the Internet? You've managed to ignore it so far. You've refused to let the organization's PC big-ots link up to it, knowing that it would open your systems to every hacker between here and East Germany (er... eastern Germany). While other people have been dazzled by its staggering growth, you've addressed the real issues affecting your organization.

Well, hold on a second. Do you remember the first PCs? Remember how people sneaked them into their departments by ones and twos without your approval? Remember how, after hundreds had been installed, users in the same department adopted different hardware, applications and LAN topologies? Things degenerated into a real mess, and only then was IS called in.

Well, the Internet is the networked version of PC chaos. Its users are outside your organization's discipline. Its growth is out of control. Its resources are unpredictable, and its topology is changing day by day. And whether you like it or not, it will be put to highly effective use. By plan or by stealth, the Internet will become essential to your organization. It's important to stop considering it an alien force and start thinking about it as an adjunct to the IS infrastructure.

If you look around, you'll find some IS managers who do not view the Internet as a problem. Rather, they see it as a possible extension of their IS infrastructure. They expect it to give them the means to help their business and a way to put their business in a position of expanding from a regional to a national presence.

In a month, First Union Corp. in Charlotte, N.C., plans to solicit new bank card customers via the Internet, and it will follow up with other basic banking services such as an option to open a checking account. In six months or so, it plans to offer customers the option of reviewing their account balances and executing transactions electronically, said Stephen Culp, the bank's World-Wide Web project manager.

First Union officials say their Internet ser-

vices will market the bank beyond its Southeast base and "prepare us for interstate banking, which is coming," Culp said.

But if the Internet is another form of PC chaos, how can banks and other organizations plan to do business over it? Doesn't business require financial transactions, with credit-card numbers floating over a highly in secure 'net?

A year ago, a group of Silicon Valley companies got together to discuss using the Internet for electronic commerce. Organizing as CommerceNet, they established a Web server in Menlo Park, Calif., with directories of its members. Each business put up vital information about itself for customers logging in around the country. The organization formed working groups to resolve the lack of security and other 'net issues.

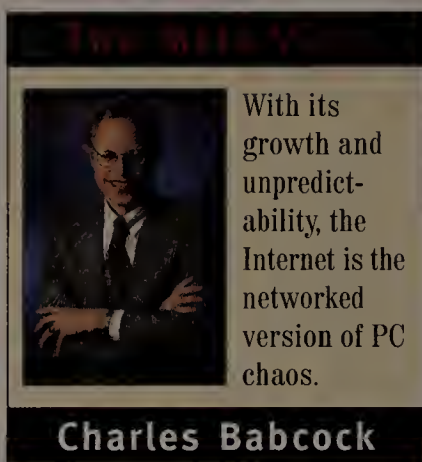
One of the founders, Enterprise Integration Technologies, Inc., paired with RSA Data Security, Inc. to

form a joint venture called Terisa Systems, Inc. in Menlo Park. In December, Terisa Systems offered Secure Hypertext Transfer Protocol (SHTTP) to CommerceNet sponsors. When First Union starts transmitting credit-card numbers over the Internet, it will use SHTTP to encrypt the transmission and establish the identity of the recipient. Future transactions will require only the user's name and password, not the card number, Culp said.

At the same time, Netscape Communications Corp., the originator of a World-Wide Web browser, is working with the Secure Sockets Layer, which wraps the established RSA security mechanism around HTTP. With this approach, a credit-card number would be transmitted for each transaction but with a layer of protection around the transmission.

Unless these efforts go seriously awry, the Internet will look like a very enticing, tumultuous opportunity for business, and IS managers had better start figuring out how to plug into it.

Babcock is *Computerworld's* technical editor. His MCI Mail address is 575-2737.



With its growth and unpredictability, the Internet is the networked version of PC chaos.

Charles Babcock

Inside Lines

OracleWare going nowhere

First, Oracle unveiled plain old Oracle7 on Novell's NetWare. Then there was OracleWare, a version of its database bundled with NetWare. After that came Oracle Workgroup Server for NetWare, a database that runs on NetWare but is sold separately. Confused? A lot of users are. But life could get simpler. Oracle plans to merge the products in the next few months, and Oracle CEO Larry Ellison recently said OracleWare was a mistake. It "doesn't seem to be going anywhere," he told *Computerworld Hong Kong*.

Intuitively speaking...

Microsoft and Intuit are reportedly close to what is called "substantial compliance" in providing information to the U.S. Department of Justice about their merger proposal. That's when the clock starts ticking on the time the Justice Department has to fish or cut bait. Once all parties agree that all materials have been delivered, the Justice Department has 20 business days to respond and can ask for at least one 10-day extension.

Keeping up with the remote Joneses

In the continuing saga of internetworking one-upmanship, Cisco this week will follow Santa Clara, Calif., neighbor 3Com in adding Integrated Services Digital Network and dial-on-demand capabilities to three entry-level remote-access routers, industry sources said. A Cisco spokesman declined to confirm or deny the reports.

Whirlpool gets off its CASE

Whirlpool is reportedly all set to standardize on Oracle for all worldwide operations, a source briefed by the Benton Harbor, Mich., appliance giant said. Whirlpool is moving away from an outmoded computer-aided software engineering (CASE)-based approach to development, which was hailed as cutting-edge in 1989. Back then, the edge meant KnowledgeWare tools, OS/2 and mainframe databases. These days, Unix and relational technology is lighting the way to Whirlpool's future, the source said.

Just do it, Dave

David Moon, Novell's senior vice president of development for the applications group, has resigned to pursue the sporting life. Moon said he and his family plan to start a sporting goods business in Utah. The technically savvy executive joined WordPerfect in 1982 and played a leading role in developing PerfectOffice, Novell's applications suite, the WordPerfect word processor and GroupWise. No specific departure date was provided.

Taking time to smell the roses

Hitachi Data Systems plans to start pitching IBM's SP2 Unix parallel processor to a few of its customers this year as part of a 1994 OEM deal. But it will be 1997, at the earliest, before parent company Hitachi Ltd. is ready to unleash a promised line of PowerPC-based Unix servers. A year after laying out a strategy for getting into the Unix market, Hitachi is "still discussing how they will use the PowerPC chips," said HDS marketing head John Clark.

All secure on the Good Ship Web

Today at Internet World in San Jose, Calif., IBM and a handful of firms, including Prodigy, America Online and Netscape Communications, will announce investments in California-based Terisa Systems for a common security platform based on Terisa's encryption technology. The deal signals the most active attempt to date among industry heavyweights to consolidate around a common standard for conducting secure transactions on the Web.

We all know how distributed computing and empowered users can cause IS managers to break out in a cold sweat. But client/server appears to have qualified as an actual psychosis. The Standish Group International in Dennis, Mass., is promoting a "client/server group therapy" service where IS folks can rap about the "hopes, goals, problems and fears" engendered by the paradigm. Couches are optional. If you'd like to unburden your soul about news or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at mjohnson@cw.com.

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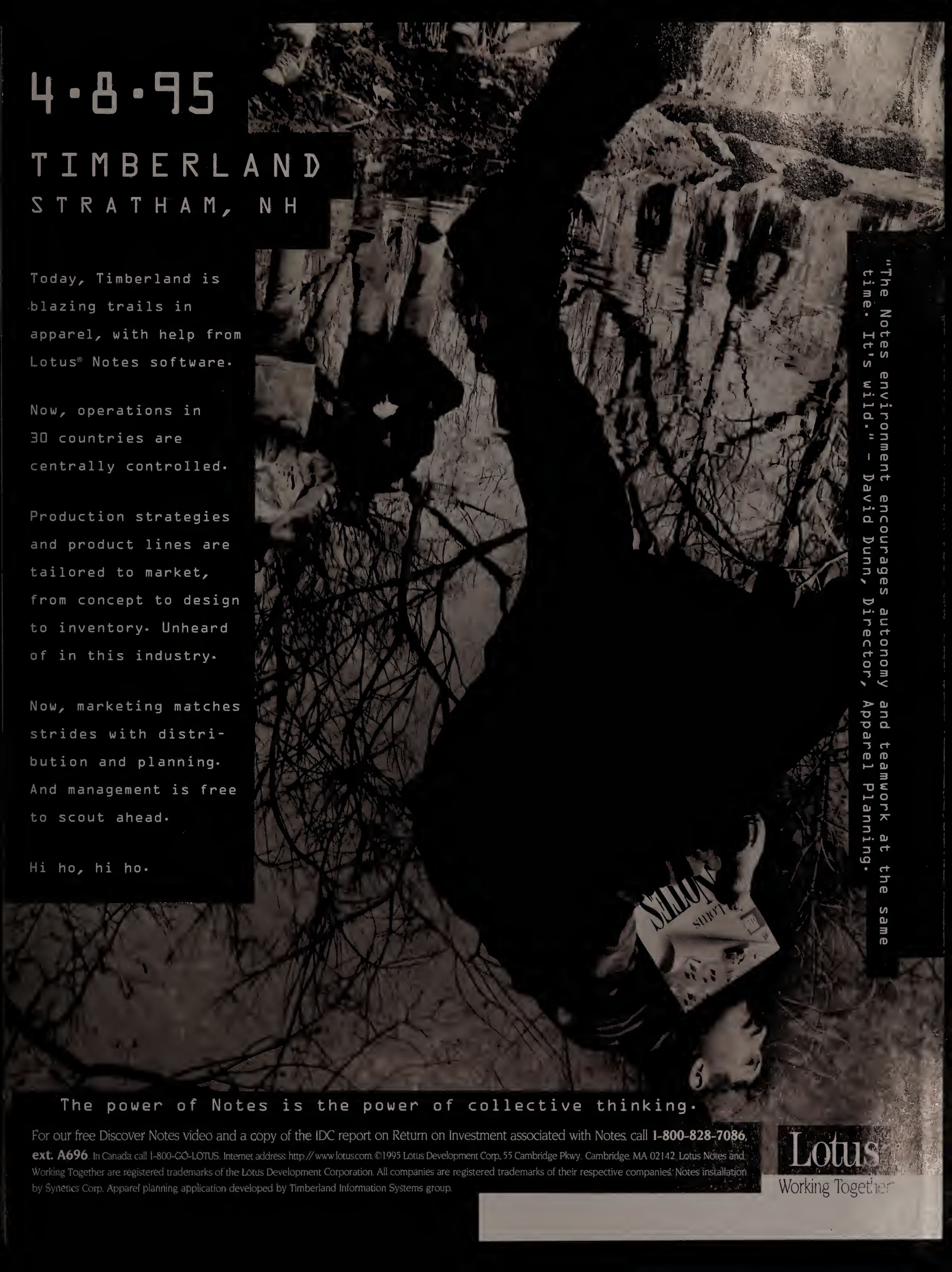
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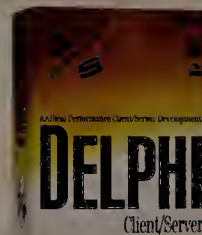
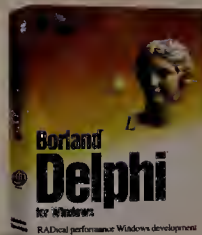
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